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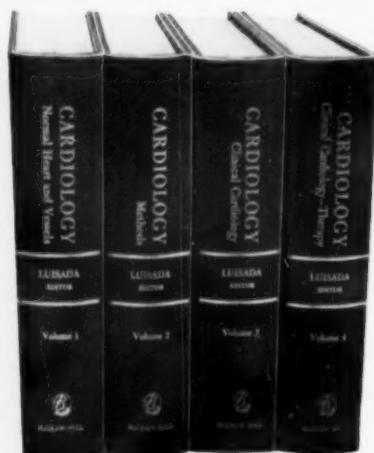
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the International Anatomical Nomenclature Committee has been used wherever possible. Information on and terminology of the cerebellum derived from the work of Larsell and others has been included. The relationship between structure and function is increasingly emphasized in this edition. Many additions and modifications of text and illustrations have been made to foster greater student understanding.

By STEPHEN WALTER RANSON, M.D., Ph.D., Late Professor of Neurology and Director of Neurological Institute, Northwestern University Medical School, Chicago; Revised by SAM LILLARD CLARK, M.D., Ph.D., Professor and Chairman of the Department of Anatomy, The Vanderbilt University School of Medicine, Nashville. 622 pages, 6½" X 9¾", with 434 illustrations, 11 in color. \$9.50.

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## INFORMATION FOR CONTRIBUTORS

*The Journal of Medical Education* serves as an international medium for the exchange of ideas in medical education, as well as a means of communicating the policies, programs, and problems of the Association. The Editorial Board welcomes the submission of manuscripts concerned with the broad field of medical education; this includes preparation for medical education; the medical school experience; intern and resident education; graduate and postgraduate medical education. The Editorial Board recognizes that medical education includes the activities of faculty, students, administrators, and those of the practicing profession who also teach and learn. Thus, it invites communications from any of these sources.

*Manuscripts* should be submitted in duplicate. All manuscripts are reviewed by the Editorial Board before acceptance for publication. All copy, including footnotes, tables, and legends, should be typed double-spaced. Each diagram or graph or photograph should have a brief legend. Each table should be typed on a separate sheet of paper. References should refer to published material only, must be submitted in alphabetical order, and should include, in order: author, title, journal abbreviation (*Quarterly Cumulative Index Medicus* form), volume number, page, and year; book references should also include editors, edition, publisher, and place of publication.

*Galley proofs* will be mailed to authors for correction before publication and should be returned within 48 hours after receipt.

*Reprints* may be ordered, when galley proofs are returned, from the University of Chicago Press, in multiples of 50, at a price depending on the length of the article; prices are listed on the reprint order form.

*Medical Education Forum* includes editorials, letters, comments, criticisms, and excerpts from important addresses.

*News from the Medical Schools:* Material for this section should be transmitted to the News Editor, Miss Neva Resek, 2530 Ridge Avenue, Evanston, Illinois. Announcements of major faculty and administrative appointments, news of distinguished visitors and significant educational developments will be included. It is not possible to publish notices on grants-in-aid for scientific research.

*Items of Current Interest:* Audio-visual news and notices from national and federal agencies appear in this section.

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Address all correspondence regarding manuscripts, editorials, and letters to the Editor to the Editorial Office, University Hospitals, University of Wisconsin, Madison 6, Wisconsin.

Address all correspondence concerning subscriptions, reprints, changes of address, and back numbers to the University of Chicago Press, 5750 Ellis Avenue, Chicago 37, Illinois. All changes of address should provide both the old and the new address.

Address all correspondence concerning news, announcements, and personnel exchange to the office of the Association of American Medical Colleges, % Miss Neva Resek, 2530 Ridge Avenue, Evanston, Illinois; address all correspondence concerning advertising to Miss Helen Claire Herman, 2530 Ridge Avenue, Evanston, Illinois.

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*Vascular Disease Clinic, New York Hospital*

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- Arterial Embolization

### VENOUS DISEASES

- Venous Insufficiency
- Thrombophlebitis
- Pulmonary Embolism and Infarction

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### VASOSPASM AND DISEASES IN WHICH IT PLAYS A ROLE

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By W. E. BRAY, B.A., M.D., Consulting Laboratory Director, Martha Jefferson Hospital, Charlottesville, Virginia. 1957, 5th edition, 731 pages, 4 $\frac{1}{2}$ " x 7 $\frac{1}{2}$ ", 124 illustrations, 18 color plates. Price, \$9.75.

### Miale LABORATORY MEDICINE—HEMATOLOGY

This book is the first truly comprehensive evaluation of the *entire field* of hematologic diagnosis. Emphasizing the correlation between laboratory and clinical data, Dr. Miale begins with the basic concepts of hemopoiesis and cell survival and progresses to a detailed presentation of the entire field. An excellent teaching aid, the book is heavily illustrated with instructive photographs and drawings including a full atlas of the morphology of blood cells complete with photomicrographs visually describing what is seen in the microscope. Chapters on blood coagulation and vascular pseudo-hemophilia make this one of the most up-to-date books in its field.

By JOHN B. MIALE, M.D., Professor of Pathology, University of Miami School of Medicine; Director of Clinical Pathology, Jackson Memorial Hospital, Miami, Florida. 1958, 735 pages, 6 $\frac{3}{4}$ " x 9 $\frac{1}{4}$ ", 192 illustrations, 9 plates including 5 in color. Price, \$13.75.

### 5th Edition Schaub • Foley • Scott • Bailey DIAGNOSTIC BACTERIOLOGY

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By ISABELLE G. SCHAUER, A.B.; M. KATHLEEN FOLEY, M.A.; ELVYN G. SCOTT, M.T. (ASCP); and W. ROBERT BAILEY, Ph.D. New. 1958, 5th edition, 338 pages, 5 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ ", illustrated. Price, \$4.75.

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## Calendar of Meetings

### ASSOCIATION OF AMERICAN MEDICAL COLLEGES

**70th Annual Meeting, November 2-4**  
**Edgewater Beach Hotel, Chicago, Ill.**

#### OCTOBER

**ACADEMY OF PSYCHOSOMATIC MEDICINE**, Sheraton-Cleveland Hotel, Cleveland, Oct. 15-17. For information write: Dr. Bertram B. Moss, Suite 1035, 55 E. Washington St., Chicago 2, Secretary.

**AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY**, The Palmer House, Chicago, Oct. 11-16. Dr. William L. Benedict, 15 Second St., S.W., Rochester, Minn., Executive Secretary.

**AMERICAN COLLEGE OF CARDIOLOGY**, Benjamin Franklin Hotel, Philadelphia, Oct. 23-25. Dr. Philip Reichert, Empire State Bldg., New York 1, Executive Director.

**AMERICAN COLLEGE OF CHEST PHYSICIANS**, 25th Anniversary Homecoming Meeting, Albuquerque, N.M., Oct. 14-17. Mr. Murray Kornfeld, 112 E. Chestnut St., Chicago 11, Executive Director.

**AMERICAN COLLEGE OF PREVENTIVE MEDICINE**, Hotel Ambassador, Atlantic City, N.J., Oct. 21-22. Dr. John J. Wright, P.O. Box 1267, Chapel Hill, N.C., Secretary-Treasurer.

**AMERICAN HEART ASSOCIATION**, Trade and Convention Center, Philadelphia, Oct. 23-27. Mr. William F. McGlone, 44 E. 23rd St., New York 10, Secretary.

**AMERICAN PSYCHIATRIC ASSOCIATION**, Detroit Divisional Meeting, Hotel Statler, Detroit, Oct. 29-31. Dr. Benjamin Jeffries, 16321 Mack Ave., Detroit 24, Co-Chairman, Planning Committee.

**AMERICAN PUBLIC HEALTH ASSOCIATION**, Convention Hall, Atlantic City, N.J., Oct. 19-23. Dr. Berwyn F. Mattison, 1790 Broadway, New York 19, N.Y., Executive Director.

**AMERICAN SCHOOL HEALTH ASSOCIATION**, Claridge Hotel, Atlantic City, N.J., Oct. 18-23. Dr. A. O. DeWeese, 515 E. Main St., Kent, Ohio, Executive Secretary.

**AMERICAN SOCIETY OF FACIAL PLASTIC SURGERY**, Chicago, Oct. 15-17. Dr. Samuel M. Bloom, 123 E. 83rd St., New York 28, Secretary.

**AMERICAN SOCIETY OF PLASTIC AND RECONSTRUCTIVE SURGERY**, Hotel Fontainebleau, Miami Beach, Fla., Oct. 18-23. Dr. Thomas Ray Broadbent, 308 E. South Temple, Salt Lake City, General Secretary.

**AMERICAN SOCIETY OF TROPICAL MEDICINE AND HYGIENE**, Claypool Hotel, Indianapolis, Oct. 28-31. Dr. Rolla B. Hill, 3575 St. Gaudens Road, Miami 33, Fla., Executive Secretary.

**CONGRESS OF NEUROLOGICAL SURGEONS**, Americana Hotel, Miami, Fla., Oct. 28-31. Dr. Richard L. DeSausure, Suite 101 B, 20 S. Dudley St., Memphis, Tenn., Secretary-Treasurer.

**NATIONAL REHABILITATION ASSOCIATION**, Statler-Hilton Hotel, Boston, Oct. 26-28. Mr. Edward D. Callahan, 14 Court Square, Boston 8, Conference Chairman.

#### NOVEMBER

**AMERICAN COLLEGE OF CHEST PHYSICIANS**, Dallas, Texas, Nov. 29-30. Mr. Murray Kornfeld, 112 E. Chestnut St., Chicago 11, Executive Secretary.

**AMERICAN MEDICAL WOMEN'S ASSOCIATION**, Arlington Hotel, Hot Springs, Ark., Nov. 12-15. Mrs. Lillian T. Majally, 1790 Broadway, New York 19, Executive Secretary.

**ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES**, Mayflower Hotel, Washington, D.C., Nov. 8-11. Lt. Col. George M. Beam, AUS, Ret., Suite 718, New Medical Bldg., 1726 Eye St., N.W., Washington 6, D.C., Executive Secretary.

**CENTRAL SOCIETY FOR CLINICAL RESEARCH**, Drake Hotel, Chicago, Nov. 6-7. Dr. Austin S. Weisberger, 2065 Adelbert Rd., Cleveland 6, Secretary.

**GASTROENTEROLOGY RESEARCH GROUP**, Drake Hotel, Chicago, Nov. 6. For information write Dr. Charles F. Code, Mayo Clinic, Rochester, Minn.

**INTERNATIONAL COLLEGE OF SURGEONS**, MID-ATLANTIC MEETING OF THE U.S. SECTION, Homestead Hotel, Hot Springs, Va., Nov. 16-18. For information, write Dr. E. G. Gill, 711 S. Jefferson St., Roanoke, Va.

**INTER-SOCIETY CYTOLOGY COUNCIL**, Statler Hilton Hotel, Detroit, Nov. 19-21. Dr. Paul A. Young, 1101 Beacon St., Brookline 46, Mass., Secretary-Treasurer.

**INTERSTATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA**, The Palmer House, Chicago, Nov. 2-5. Mr. Roy T. Ragatz, Box 1109, Madison 1, Wis., Executive Secretary.

**NATIONAL PROCTOLOGIC ASSOCIATION**, Chicago, Nov. Dr. George E. Mueller, 59 E. Madison, Chicago 2, Secretary.

**NATIONAL SOCIETY FOR CRIPPLED CHILDREN AND ADULTS**, Palmer House, Chicago, Nov. 29-Dec. 2. Dr. Dean W. Roberts, 2023 W. Ogden Ave., Chicago 12, Executive Director.

**RADIOLOGICAL SOCIETY OF NORTH AMERICA, INC.**, Palmer House, Chicago, Nov. 15-20. Dr. Donald S. Childs, 713 E. Genesee St., Syracuse 2, N.Y., Secretary-Treasurer.

#### DECEMBER

**ASSOCIATION FOR RESEARCH IN NERVOUS AND MENTAL DISEASE, INC.**, Hotel Roosevelt, New York City, Dec. 11-12. Dr. Rollo J. Masselink, 700 W. 168th St., New York 32, Secretary-Treasurer.

**FIRST ANNUAL GRADUATE MEDICAL EDUCATION CONFERENCE-RESIDENCY TRAINING PROGRAM**, Univ. of Pennsylvania, Philadelphia, Dec. 3-4. Dr. Alfred S. Frohse, Graduate School of Medicine, U. of Pennsylvania, Philadelphia 3, Chairman.

**MEDICAL SOCIETY OF THE UNITED STATES & MEXICO**, Valley Ho Hotel, Scottsdale, Ariz., Dec. 2-4 (followed by two-day session Desert Inn, Las Vegas, Nev.). Dr. A. H. Talakson, 2025 N. Central Ave., Phoenix, Ariz., Convention Co-Chairman.

#### 1960

#### JANUARY

**AMERICAN ACADEMY OF ALLERGY**, Hollywood Beach Hotel, Hollywood-by-the-Sea, Fla., Jan. 11-13. Mr. James O. Kelly, 756 N. Milwaukee St., Milwaukee 2, Wis., Executive Secretary.

**AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS**, The Palmer House, Chicago, Jan. 23-28. Mr. John K. Hart, 116 S. Michigan, Chicago 3, Executive Secretary.

**AMERICAN COLLEGE OF SURGEONS**, Sectional Meeting, the Brown Hotel, Louisville, Ky., Jan. 21-23. For information write: Dr. H. P. Saunders, 40 E. Erie St., Chicago 11.

## **Quimby, Feitelberg & Silver— Radioactive Isotopes in Clinical Practice**

**By EDITH H. QUIMBY, Sc.D.**

Professor of Radiology (Physics), College of Physicians and Surgeons, Columbia University

**SERGEI FEITELBERG, M.D.**

Director, Physics Department, The Mt. Sinai Hospital; Associate Clinical Professor of Radiology,  
College of Physicians and Surgeons, Columbia University

**and SOLOMON SILVER, M.D.**

Attending Physician, Chief, Thyroid Clinic, The Mt. Sinai Hospital; Associate Clinical Professor of  
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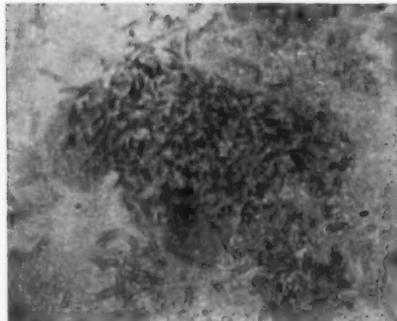
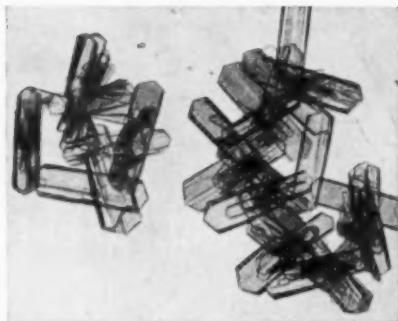
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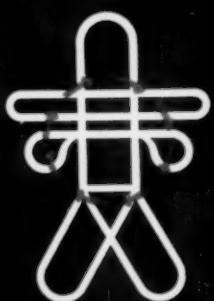
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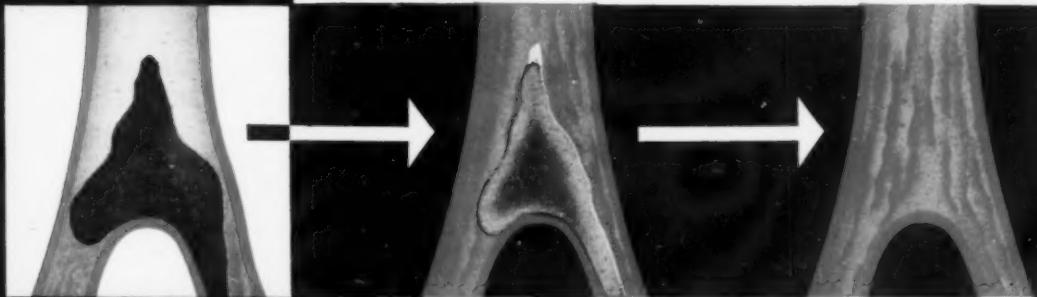


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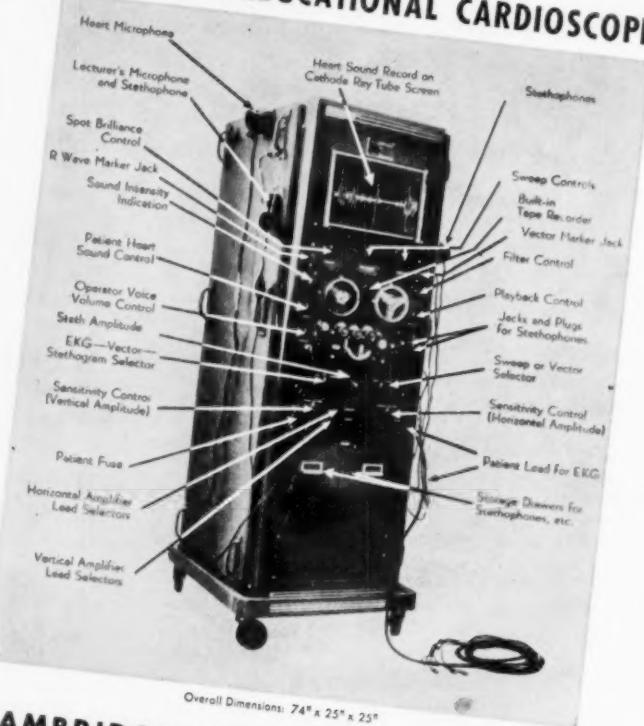
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1. Case reports on file, Wyeth Laboratories. 2. Parks, R.V., and Moessner, G.F.: Dual Approach to Patient Care, Scientific Exhibit, A.A.G.P., April, 1959.

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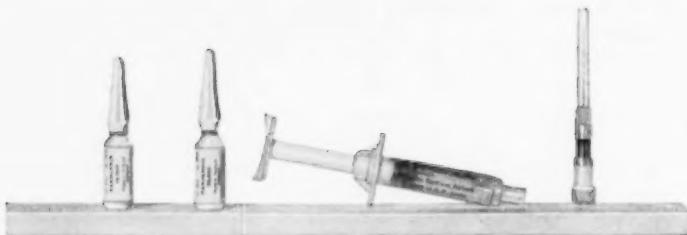
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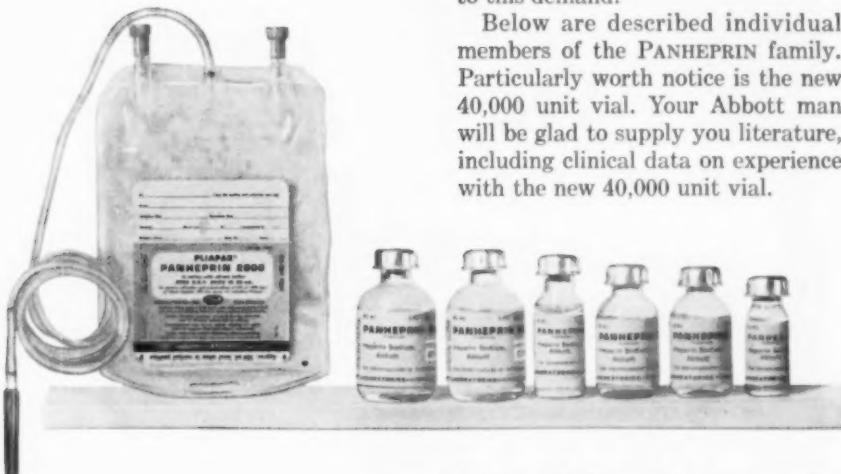
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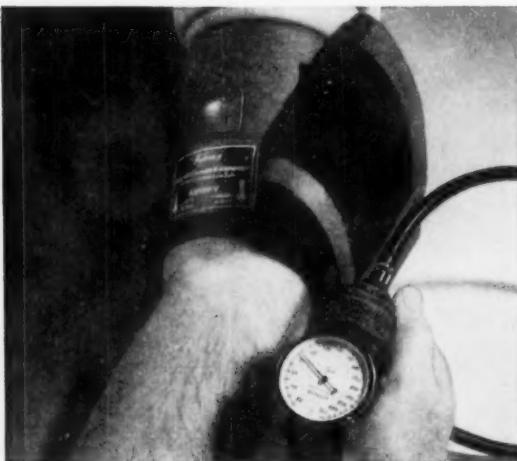
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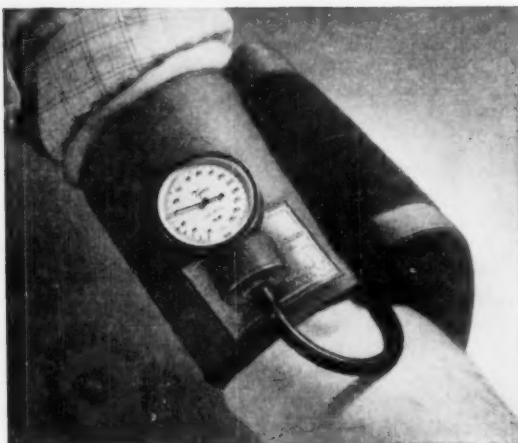
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# The Journal of MEDICAL EDUCATION

VOLUME 34 • NUMBER 10 • OCTOBER, 1959

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# Assessment of Intellectual Promise for Medical School

JOSEPH K. HILL, PH.D.\*

State University of New York, Brooklyn, N.Y.

Relatively few reliable measures of intellectual promise are available to medical college admission committees in their search for the best candidates for medical school. College grades, college science grades, Medical College Admission Test (MCAT) scores, and the recommendations of college pre-medical advisors, are the most frequently used criteria. *The Appraisal of Applicants to Medical Schools* (3, p. 33), edited by Gees and Cowles, indicates the degree to which medical colleges rely on each of these.

A few studies have been made of the relationships of these criteria to medical school performance (1, 4, 5). However, certain questions still remain unanswered, or answers remain in the realm of opinion.

For example, as Glaser states ". . . low MCAT scores and high grades, and the reverse combination of high MCAT scores and low grades, are viewed unfavorably [as a matter of opinion among admissions committee members] . . ." "High MCAT scores with low grades suggest that the applicant has good intellectual potential, but further investigation must be made to determine why the student did not perform well in college, despite the apparent intellectual promise. . ." "On the other hand, low MCAT scores accompanied by high grades indicate certain other possibilities, such as truly low potential, but apparent high scholastic achievement through an easy grading system or through intense concentration on studies by the student" (3, pp. 34-36).

The studies reported in this paper attempt to elucidate the truth of these and

\* Executive Assistant to the President of the Medical Center.

certain other suppositions. The premedical academic performance records of 12,389 applicants to the State University of New York College of Medicine in Brooklyn between 1950 and 1957 were studied. An arbitrary cutting score of 500 on the MCAT, and college average grade groupings of A/A-, B+/B, and B-/C, were used.

There is evidence to suggest a relationship between premedical college averages

TABLE 1  
RELATIONSHIP OF COMBINED\* MCAT SCORES  
TO UNDERGRADUATE COLLEGE AVERAGE

MCAT SCORE (ALL PARTS)	COLLEGE FOUR-YEAR AVERAGE		
	A/A-	B+/B	B-/C
500 and above	96%	77%	46%
499 and below	4%	23%	54%
	$\chi^2 = 830.17 \dagger$		$p < .001$
	N = 6147		

\* The term "combined scores" as used in this paper refers to all scores in the combination being 500 or above or all scores below 500. Scores are not averaged.

† Computed, as in the case of all succeeding tables, from original frequencies.

and MCAT scores (3, p. 41). This relationship can be demonstrated and tends to strengthen the predictive validity of each type of measure.

If the Medical College Admissions Test is taken as a whole, 6147 applicants scored consistently, either high (500 or above) or low (below 500), on all four sub-tests. Among these consistent scorers, the "high-low" MCAT ratios by college average are given in Table 1. Ninety-six per cent of consistent scorers in the A/A- group are high on MCAT, while only 46 per cent consistent scorers are high in the B-/C group. This dif-

ference is undoubtedly not due to chance.

The same general ratios exist with each sub-test of the MCAT. In Table 2, the Science and Quantitative parts combined present a closer relationship than any of the individual sub-tests alone.

The undergraduate science average of 2500 applicants was compared with combined Quantitative-Science sub-test scores, and the ratios are essentially the same as with the over-all average (see Table 3).

The real question for the medical schools

is the extent to which college averages, MCAT scores, and recommendations relate to success (or lack of success) in medical school.

A further study of 1000 students admitted to the State University Medical Center in Brooklyn between 1950 and 1957 was undertaken and is reported here. As Gee points out, care should be taken to avoid invalid conclusions from an already highly selected sample (2). However, for this group of medical students, certain rela-

TABLE 2

RELATIONSHIP OF THE SEPARATE PART SCORES  
OF THE MCAT TO UNDERGRADUATE  
COLLEGE AVERAGE

MCAT SCORE	COLLEGE FOUR-YEAR AVERAGE		
	A/A -	B+/B	B-/C
<b>Verbal:</b>			
500 and above	87%	68%	51%
499 and below	13%	32%	49%
	$\chi^2 = 524.59$		$p < .001$
	$N = 12,389$		
<b>Quantitative:</b>			
500 and above	79%	60%	41%
499 and below	21%	40%	59%
	$\chi^2 = 601.41$		$p < .001$
	$N = 12,181$		
<b>Modern Society:</b>			
500 and above	85%	67%	54%
499 and below	15%	33%	46%
	$\chi^2 = 359.53$		$p < .001$
	$N = 12,327$		
<b>Science:</b>			
500 and above	90%	68%	54%
499 and below	10%	32%	46%
	$\chi^2 = 965.08$		$p < .001$
	$N = 12,339$		
<b>Quantitative and science:</b>			
500 and above	92%	70%	40%
499 and below	8%	30%	60%
	$\chi^2 = 1051.15$		$p < .001$
	$N = 8886$		

TABLE 3

RELATIONSHIP OF THE QUANTITATIVE AND SCIENCE SCORES COMBINED TO THE UNDERGRADUATE COLLEGE SCIENCE AVERAGE

MCAT SCORE	COLLEGE FOUR-YEAR SCIENCE COURSE AVERAGE		
	A/A -	B+/B	B-/C
<b>Quantitative and science:</b>			
500 and above	90%	75%	50%
499 and below	10%	25%	50%
	$N = 2520$		

TABLE 4

RELATIONSHIP OF COLLEGE FOUR-YEAR AVERAGE GRADE AND FIRST-YEAR PERFORMANCE IN MEDICAL SCHOOL

MEDICAL SCHOOL	COLLEGE FOUR-YEAR AVERAGE		
	FIRST-YEAR AVERAGE*	A/A -	B+/B
2.00%	87%	74%	50%
1.99-	13%	26%	50%
	$\chi^2 = 45.011$		$p < .001$
	$N = 1000$		

\* Calculated on a 0.00 to 4.00 scale.

TABLE 5

RELATIONSHIP OF COLLEGE RECOMMENDATIONS TO FIRST-YEAR PERFORMANCE IN MEDICAL SCHOOL

Medical school	Weak to average	Above average to outstanding	
		2.00+	1.99-
		73%	74%
		27%	26%
	$\chi^2 = .0885$		$p = .80$
	$N = 1000$		

tionships seem to be valid and significant. For example, the study shows a relationship between college grade averages and first-year performance in medical school. As can be seen in Table 4, 87 per cent of the "A" students achieved a 2.00 or better medical college first-year average, while only 50 per cent of the "below B" students achieved such an average.

Although Dykman and Stalnaker (1) presented some data along these lines, the data here are based on medical college averages, rather than failures or repeaters.

Recommendations of college faculties bore no relationship to success in first-year medical school. Table 5 shows almost the

same percentages of performance in the strong recommendation group as in the weak group.

There is a close significant relationship, however, of combined MCAT scores to first-year medical school performance. Table 6 shows the comparative ratios of consistent high and low MCAT performers.

It has been suggested that perhaps some sub-tests of the MCAT would serve as

chance of success during his first year than if both of these scores are below 500.

As would be expected, among students who score 500 or better on all sections of the MCAT, the medical school performance varies with the college average (see Table 9).

Table 10 shows the relative percentages for 1000 first-year medical students analyzed by college average and sub-test scores. One important relationship seems to stand out. That is, whereas "A" and "B" college stu-

TABLE 6

RELATIONSHIP OF TOTAL MCAT SCORES TO  
FIRST-YEAR MEDICAL SCHOOL  
PERFORMANCE

MEDICAL SCHOOL	MCAT ALL PARTS*	
	FIRST-YEAR	500 score or above
2.00+ Av.	82%	26%
1.99- Av.	18%	74%
	$\chi^2 = 38.36$	$p < .001$
	N = 594	

\* With all scores 500 or above or all scores below 500.

TABLE 8

RELATIONSHIP OF COMBINED SCORES ON SCIENCE AND QUANTITATIVE SECTIONS OF MCAT TO FIRST-YEAR PERFORMANCE IN MEDICAL SCHOOL

MEDICAL SCHOOL	BOTH SCIENCE AND QUANTITATIVE	
	FIRST-YEAR	500 scores or above
2.00+ Av.	81%	43%
1.99- Av.	19%	57%
	$\chi^2 = 60.350$	$p < .001$
	N = 751	

TABLE 7

RELATIONSHIP OF SEPARATE MCAT SCORES TO FIRST-YEAR PERFORMANCE  
IN MEDICAL SCHOOL

MEDICAL SCHOOL	FIRST-YEAR	PER CENT WITH MCAT SCORES ABOVE OR BELOW 500							
		Verbal	Quantitative	Modern Soc.	Science				
	AVERAGE	500+	499-	500+	499-	500+	499-	500+	499-
2.00+ Av.	75	68	78	59	76	55	79	47	
1.99- Av.	25	32	22	41	24	45	21	53	
	$\chi^2 = 2.6709$	$\chi^2 = 30.28$	$\chi^2 = 23.920$	$\chi^2 = 70.90$					
	$p = .10$	$p < .001$	$p < .001$	$p < .001$					
	N = 1000								

better predictors than others, or that certain combinations of scores or scores patterned with undergraduate grades in certain ways, would tend to predict better (3, pp. 34-35). If scores on individual sections of the MCAT are compared with first-year medical school performance (see Table 7), it can be seen that positive relationships exist, with the Science sub-test being the closest and the Quantitative sub-test next. Those who score well on both of these sub-tests have a significantly better performance in medical school than those who score low on both (see Table 8). From the statistical standpoint, the applicant with both Science and Quantitative scores above 500 has something approaching a 40 per cent better

chance of success during his first year than if both of these scores are below 500. As would be expected, among students who score 500 or better on all sections of the MCAT have an 80-90 per cent chance of getting a 2.00 (or better) first-year medical school average, equally good (presumably) college students who score below 500 on the Science or Quantitative sections have only a 50-70 per cent chance of making a 2.00 average or better. Further, it should be noted that among "A" students, a contrastingly larger percentage are in academic difficulty who score below 500 on the Science and Quantitative sub-tests, than on the other two sub-tests.

The significant relationship is apparent in Table 11, where Science and Quantitative scores are combined (751 students). The

relatively poor student with high MCAT scores would appear to have something approaching a 50-50 chance of staying out of academic difficulty during his first year. However, he may have a slightly better chance than the better student who scores below 500 on both the Science and Quantitative sub-tests. A fifth of the group that performed poorly in first-year medical school were students with good collegiate records but below average Science and Quantitative MCAT scores.

The pattern varies from college to college, as would be expected. Table 12 shows this variation. Colleges B, C, and D conform fairly well to the general pattern, but Col-

lege A does not. Although 90 per cent of the 44 students admitted from College A had a "B" average or better in college, half were in the low medical school performance group. If one accepts the MCAT score as a standardized measure, then, it may be inferred either that College A is grading high and that many in the "A/B" grade should really be in the "B-C" grade; or that the college subjects taken do not relate to preparation for first-year medical school. Actually, from our knowledge of College A, both of these explanations may apply. Numbers are too small, of course, to draw any concrete conclusions.

To summarize, analysis of the perform-

TABLE 9  
RELATIONSHIP OF ALL COMBINED MCAT SCORES TO FIRST-YEAR MEDICAL SCHOOL PERFORMANCE BY COLLEGE AVERAGES

MEDICAL SCHOOL	A/A-average		COLLEGE AVERAGE		B-/C average	
	all MCAT scores	500+	all MCAT scores	500+	all MCAT scores	500+
FIRST-YEAR						
AVERAGE	500+	499-	500+	499-	500+	499-
2.00+ Av.	91%	0%	82%	30%*	57%	0%
1.99- Av.	9%	100%†	18%	70%	43%	100%†
	$\chi^2 = 32.81$		$p < .001$			
N=419						

† One or two students.

TABLE 10  
RELATIONSHIP OF COLLEGE AVERAGE COMBINED WITH INDIVIDUAL MCAT SCORES TO FIRST-YEAR PERFORMANCE IN MEDICAL SCHOOL

MEDICAL SCHOOL	A/A-		COLLEGE AVERAGE			
	Vebral score	B+/B	500+	499-	500+	499-
FIRST-YEAR						
AVERAGE	500+	499-	500+	499-	500+	499-
2.00+	87%	86%	75%	69%	54%	27%
1.99-	13%	14%	25%	31%	46%	73%
	$\chi^2 = 53.642$		$p < .001$			
Quantitative Score						
500+	499-	500+	499-	500+	499-	
2.00+	90%	63%	79%	61%	51%	45%
1.99-	10%	37%	21%	39%	48%	55%
	$\chi^2 = 68.54$		$p < .001$			
Modern Society						
500+	499-	500+	499-	500+	499-	
2.00+	87%	81%	76%	56%	55%	20%
1.99-	13%	19%	24%	44%	45%	80%
	$\chi^2 = 70.95$		$p < .001$			
Science						
500+	499-	500+	499-	500+	499-	
2.00+	88%	67%	79%	49%	57%	32%
1.99-	12%	33%	21%	51%	43%	68%
	$\chi^2 = 102.75$		$p < .001$			
N=1000						

ance records of over 12,000 medical school applicants and 1000 first-year medical students shows the following:

1. A significant positive relationship exists between MCAT scores and college

TABLE 11

RELATIONSHIP OF COLLEGE AVERAGE COMBINED WITH SCIENCE AND QUANTITATIVE MCAT SCORES TO FIRST-YEAR PERFORMANCE IN MEDICAL SCHOOL

MEDICAL SCHOOL	FIRST-YEAR	COLLEGE AVERAGE			
		A/B	Science and Quantitative Combined	B-/C	B-/C
		500% 499-	500+ 499-		
	2.00+	84% 46%	54% 31%		
	1.99-	16% 54%	46% 69%		
		$\chi^2 = 90.24$			
		$p < .001$			
		N = 751			

TABLE 12

RELATIONSHIP OF COLLEGE AVERAGE COMBINED WITH SCIENCE AND QUANTITATIVE MCAT SCORES TO FIRST-YEAR PERFORMANCE IN MEDICAL SCHOOL

MEDICAL SCHOOL	FIRST-YEAR	COLLEGE AVERAGE			
		A/B	Science and quantitative combined	B-/C	B-/C
College A: N = 44					
	2.00+	59%	27%	100%*	33%
	1.99-	41%	73%	0%	67%
College B: N = 64					
	2.00+	83%	100%	50%	0%
	1.99-	17%	0%	50%	0%
College C: N = 144					
	2.00+	82%	50%	42%	0%
	1.99-	18%	50%	58%	100%
College D: N = 67					
	2.00+	82%	72%	50%*	100%*
	1.99-	18%	28%	50%	0%

\* One or two students.

4-year averages. The same relationship seems to hold for college science course averages.

2. This relationship holds for each of the MCAT sub-tests separately and for the Science and Quantitative sub-tests combined.

3. The relationship between college averages and MCAT scores tends to substantiate the validity of each, since they are both

independent measures of intellectual ability.

4. A positive relationship exists between college averages and performance in first-year medical school.

5. There would appear to be no relationship, in this study at least, between general college recommendations and first-year medical school performance.

6. MCAT scores combined bear a positive relationship to first-year medical school performance. A positive relationship holds for each sub-test, with the possible exception of the Verbal Ability Test.

7. Combined Science and Quantitative sub-test scores using 500 as a cutting score (i.e., both scores 500 or above or both below 500), bear a better relationship than any of the sub-tests alone.

8. Among students with college records

of "B" average or better, those scoring below 500 on both the Science and Quantitative sub-tests have, as a group, significantly poorer performance in first-year medical school than those who score 500 or above on both tests.

9. In this study, students who had a relatively poor college record but scored 500 or above on both the Science and Quantitative

sub-tests, had generally about a 50 per cent chance of staying out of academic difficulty during the first year.

10. The general pattern varies among individual college groups, with the likelihood of most following the pattern but a few standing out as exceptions, probably because of unusual grading policies.

In commenting on the data, it may be concluded that, although college grades are useful in selecting medical students, the Medical College Admission Test is perhaps of equal value, particularly if used as a check on the standard of grading from certain colleges. Although other patterns may be useful in assessing academic ability, the pattern of apparently adequate academic achievement, as indicated by grades, related to poor aptitude for science and quantification, as indicated by MCAT scores, is one that should be carefully evaluated before admitting the student.

It is hoped to bring out the nature and strength of this relationship in subsequent studies.

Although general recommendations (e.g.,

"this is an out-standing student") from the colleges may be useful to medical school admissions committees in other respects, evidence in this study shows them to be of possibly little value in predicting first-year academic success.

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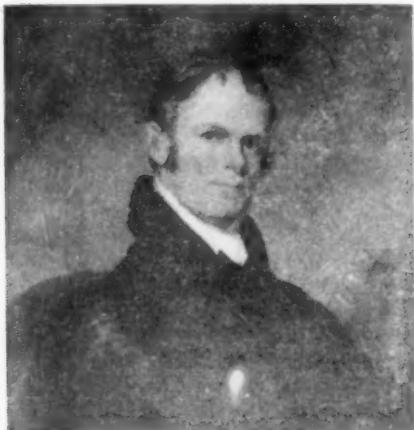
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## Charles Caldwell, a Biographic Sketch\*

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A rebirth of medicine from the bigotry of fads and theories of practice into the light of modern science marked the first half of the nineteenth century. Medicine advanced from beneath the cloud of superstition to take a dignified, deserved position among its fellow sciences. Of necessity such a

in the prevalent medical unrest. The system of practice of Cullen had collapsed; and, on its ruin, the dominant Benjamin Rush was endeavoring to establish his theory of the unity of disease. Disputation was the order



CHARLES CALDWELL IN HIS EARLIER YEARS (FROM  
THE PORTRAIT BY SULLY IN THE COLLEGE OF  
PHYSICIANS, PHILADELPHIA)

momentous transition was attended by controversy, abetted not a little by the instability of the post-bellum period in America. Philadelphia, the center of affairs medical in that day, was naturally seriously involved

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CHARLES CALDWELL IN HIS LATER YEARS (EN-  
GRAVED FROM A PAINTING BY J. R. LAMBDIN, FROM  
THE UNIVERSITY OF LOUISVILLE, KENTUCKY)

of the day; nor were the methods pursued always above reproach. The scurrilous William Cobbett, under the pseudonym of Peter Porcupine, and other pamphleteers were disturbing the traditional tranquillity of this Quaker seat of learning.

Unfortunately the idealism of John Morgan had been largely replaced by intrigue

and petty politics at Pennsylvania. Indeed, the system of medical education then in vogue engendered similar conditions in medical centers everywhere. Medical schools were essentially proprietary, and the income of their professors depended on the popularity of the group as a whole. The system of direct financial return from medical instruction was in itself reprehensible; supplemented by the existent plan of medical apprenticeship and house or private tutelage, a vicious cycle was instituted which bore fruit in suspicion and calumny.

This period marked the spread of medical education beyond the Alleghenies, and the subject of this discourse was intimately connected with the establishment of two medical schools in the Mississippi Valley.

Charles Caldwell was a fitting product of these turbulent times. His years (1772-1853) link three important generations of American medicine. By reason of his longevity, personal characteristics, and associations, his *Autobiography* furnishes a wealth of historical information. Unfortunately for the accuracy of this elaborate contribution, Caldwell disregards his laudable admonition against self-adulation and deep emotion, and plunges into the relation of events and circumstances which scarcely savor of diffidence or equanimity. However, "surcharged as it is with venom and rancour," it remains "a storehouse of facts (and fancies!) relating to the University of Pennsylvania, to Rush and to the early days of the Transylvanian University and the Cincinnati schools. Pickled in vinegar, the work is sure to survive."

Although accused "of using more words to say nothing than any other American medical writer of the last century," Caldwell possessed a facility of expression which lends an intimate personal touch to the description of notables with whom he associated. At the beck of his magic pen, the methodical Adam Kuhn stalks stiffly from the written page, clad in the black breeches and long-skirted buff waistcoat of the day, with full hand and bosom ruffles. "So sternly and stubbornly regular were his steps: . . .

that he could scarcely be induced to quicken or lengthen them, either to escape from a thunder-gust or a hail-storm, to relieve colic, to arrest hemorrhage, or scarcely to save the life of the most meritorious of his patients." As faithfully does he portray the suave, polished Rush. Nor does the cockney accent of the famous Priestley escape his attention. The conjurer presents Caspar Wistar, the hustler, "often out of breath and forever out of time." In person, florid and apoplectic, Wistar was possessed of a sensitive nature and quick temper, which time and self-restraint ultimately held in abeyance, until conventional history leaves us only the charming host of mature years. A colleague of Caldwell at Lexington elicited this comment: "But his nerves seemed made of aspen leaves, interwoven with the leaves of mimosa sensitiva, that trembled and shrank from the slightest touch of responsibility."

Caldwell possessed a wonderful command of English and eloquence of expression, which made him respected as a public speaker and feared as a disputant. The following extract from "An Address to the Philadelphia Medical Society, February 20, 1801, on the Analogies between Yellow Fever and True Plague" testifies to these powers: . . . "I disclaim all pretension to the ornaments of rhetoric. It neither comports with my qualifications, nor falls within my aim, to awaken your sorrows by the engineery of pathos; it belongs not to me to conduct you enraptured through the Elysium of fancy, to cull on our way the flowers of taste, and strew them before you in the extravagance of declamation; nor is mine the power to overwhelm your souls by the grandeur of imagery, to lead them captive by the magic of harmony, nor to hurry them away by energy of action; the accomplishment of these ends calls for endowments which none but the favourites of nature can boast."

Charles Caldwell was a physical giant, an adept with the sword and foil and an expert marksman with the pistol and rifle. He had but few equals in running, leaping, and horsemanship. His carriage was erect and

commanding. His head was massive and well poised; his eyes, bluish grey; his mouth, large with thin lips set in a straight line. Courtly in manner, he practised his belief that "propriety, civility and courtesy of behavior" were the marks of good breeding. In personal habits he was most abstemious and regular.

The personality of Charles Caldwell lent itself admirably to the times. He classified himself as a "soul enamoured of conflict." Agnew has estimated him, "a man unquestionably of remarkable intellectual force, combined, however, with such incongruous elements of character as were calculated to defeat the best appointed plans of ambition." A contemporary commentary on his character is illuminating: "A man of handsome talents, but something of an evil nature is lurking about him, I suspect." His egotism was colossal. On one occasion he remarked that, from the viewpoint of the phrenologist, there were three truly great heads in America, Webster, Clay, and "modesty forbids." He was the soul of inconsistency. Vindictive by nature and unbending in conflict, Charles Caldwell was destined to have his most cherished ambition shattered. This disappointment warped the vigorous mind of the virile young man and embittered his declining years.

Born of pure Hibernian blood in Caswell County, North Carolina, May 14, 1782, Charles Caldwell was the youngest of a large family. The parental stock is traced back to the French Colvilles, three scions of which family fled their native land for Great Britain with a price on their heads. One brother lost his life in the flight from France. From the remaining two, all the Caldwells of Great Britain and America have been derived. Of his mother's immediate ancestry nothing can be learned; we have only his statement that she was "of a family of highly reputable standing, but of no wealth." One of her forebearers, Colonel Murray, in command of the cavalry at Pennyburn Mills before Londonderry challenged King James' cavalry leader, Lieutenant General Maimont, to personal conflict

and, before the assembled armies, slew him.

The elder Caldwell was a man of great physical strength and personal beauty. Dependent on the meager income of a younger son, he was forced through the increasing responsibilities of family to give up the military service and to seek his fortune in America. Sir David Caldwell, an older brother, remarked "that spendthrift young dog, Charley, if he did not break his neck in some of his freaks, or fall in a duel, or be killed in some other madcap affray, would yet be a general—ay, and a brave one, too." Settling in Newark, Delaware, the Caldwells conducted a successful merchandise business, until the father, attracted by the greater promise of agricultural pursuits, took up land in Caswell County, North Carolina. Prosperity was again his lot, and he became quite a man of affairs in that state. He was one of the distinguished signers of the Mecklenberg Declaration and with two older sons served in the Revolutionary war.

Favored as a younger son and encouraged in his studious habits, Charles, junior, cultivated application and intellectual initiative beyond his years. In their frontier existence, instruction was most desultory and instructors, indifferent. His early tutelage was far from stimulating, with one exception: his first Latin teacher, the cadaverous Dominie Harris, sowed the seed of oratorical aspiration in the fertile mind of young Caldwell. The loss of his parents when he was fourteen threw an unexpected financial burden on the boy; but undaunted he undertook the charge of Snow Creek Seminary, a grammar school near Bushy Mountains, North Carolina. In this capacity his natural discipline and aloofness from boys of his own age offset his extreme youth. Furthermore, from this experience he gained mental precision and self-confidence. Before he had attained the age of eighteen, Caldwell was called to establish another preparatory school in North Carolina, Center Institute.

From the beginning, his education had been pointed toward the Presbyterian ministry. But "he had conceived a few opinions in religion deemed uncanonical, under the

influence of which he could not, consistently with his sentiments of truth and honor, select and pursue the clerical profession." Further, while protesting his fidelity to the church, he urges, "Should scriptural tenets be opposed, therefore, to nature, they ought to be rejected, however venerable time may have rendered them, whatever sanctity they may have been supposed to possess on account of their source, or whatever authority they may have derived from the advocacy of divines and scholars, and the homage of Christendom." More bombastic is the following quotation in criticism of Noah's ark, uncanonical, indeed!

'Black Hole of Calcutta' was a paradise to it! . . . Yet Noah and his family and the hosts of animals enshrined with them in the horrid dormitory, without air, without light, and filthier far than the Augean stables, emerged from it in health, after soaking in it for a hundred and fifty days!

We are told, by the fanatical defenders of the scheme, that the lives of Noah and his retinue were saved by miracle. By miracle, indeed, it was, and one of the most stupendous the Diety ever performed. And as easily, and in much less offensive style, could he have saved them on a few floating planks, a fleet of egg-shells, or the uncovered and obedient surface of the waters.

Excluded by these circumstances from the profession, for which he had prepared, Caldwell considered law, the military service, and medicine. Law was rejected by reason of a pledge given his father. The advice of friends caused him to choose medicine in preference to military service. In later years Caldwell regretted this choice.

I have always considered my attachment of myself to the profession of medicine an injudicious measure. True, I have subsisted by it, done in it some good, accumulated some property and acquired some reputation. But it has in certain respects cramped my mind, limited the exercise of its faculties, and withheld me from a sphere of action to which I consider myself better adapted. My choice of a profession has been therefore unwise.

To further prepare for his medical education, he spent 1½ years in Salisbury, North

Carolina, under the preceptorship of a Dr. Harris, brother of his old tutor, Dominic Harris. Unfortunately, Dr. Harris, though a recent graduate of the University of Pennsylvania, possessed a very inadequate library. The time spent under his instruction Caldwell terms "the most unqualified and indefensible waste of time I have ever committed."

During Caldwell's stay in Salisbury, President Washington made a tour of the South. His route on the return trip passing through Salisbury, it was decided to give him a fitting military escort and reception. After considerable preparation lots were drawn to form the advance party, and Caldwell was one of the fortunate members of the company selected. Then he further was chosen to lead this party and to welcome Washington. To his utter chagrin on meeting the distinguished general he was struck speechless and could do nothing but salute in silence. Although Washington had, in the meanwhile, by his gracious courtesy put him entirely at ease, again on parting, Caldwell was too moved for words. Particular reference is made to the veneration in which Washington was held.

An episode in the Chestnut Street Theatre, Philadelphia, serves to emphasize this impressionable phase of Caldwell's nature. During a performance of "Alexander the Great," the murder scene so affected him that, when the glittering dagger was drawn, he sprang to his feet and only physical force prevented him from disarming the actress. Of course, the climax of the play was interrupted, and laughter greeted stage effects intended to be tragic.

In the choice of a medical school, Caldwell turned to Pennsylvania which during this period easily outranked all other medical schools in America. Her faculty by personal qualifications and training was superb. Shippen, Wistar, Kuhn, Rush, Griffitts, and Hutchinson were outstanding names in that day. Furthermore, Philadelphia was the metropolis of the United States. In commerce this city far exceeded New York, until the pestilence of yellow fever in 1793

started the pendulum of trade swinging to the north. The placid atmosphere of the Quaker center fostered art and learning.

The opportunities for intellectual advancement in Philadelphia loomed as an oasis to the knowledge-thirsty youth. However, his ambition in oratory was not stimulated by certain lawyers, distinguished for their powers of persuasion, nor by the style of certain notable clergymen of the city. However, an extraordinary opportunity to study the style and manner of address of successful public speakers was afforded by Congress then in session. Flowery oratory was held in high esteem at that time, and the spirit of emulation was strong in the young Southerner. James Madison was commanding the respect of the House by his pointed thrusts in debate. Ames was holding his audiences spellbound by the polish and brilliancy of his speeches. In fact, a more auspicious setting for the education of the ambitious youth could scarcely be pictured.

The medical school was opened in the autumn of 1792 by the inaugural address of the venerable William Shippen. But for his striking presence and suave personality, the uninteresting lecture, read in a monotone, must have left a poor impression. The subject matter was taken unaltered from Shippen's honored master, William Hunter, and dealt in a stereotyped manner with the composition of man. Tradition credits Shippen with the repetition of this lecture at his inaugural address without alteration or addition from the opening of the medical school until his death. The brilliance of Benjamin Rush's introductory lecture on the following day dissipated Caldwell's fears as to an injudicious choice of medical school. His impressive conversational tone carried the weight of conviction. Only when excited, did he wax eloquent. He possessed the power of stimulating his auditors. His enthusiasm was contagious. The concurrence of Rush in certain long cherished thoughts on the equality of Americans and Europeans led Caldwell to prepare a laudatory notice of the lecture. This article appearing in the *Aurora*, a newspaper edited by B. F. Bache, grand-

son of Benjamin Franklin, created considerable comment. The chair of the theory and practice of physic was occupied by Adam Kuhn of disconcertingly punctual habits. Although trained under Linnaeus and the elder Monro, his lectures directly derived from Cullen, were most commonplace. Caspar Wistar, as adjunct in anatomy and surgery, had not yet developed to his eminent position in practice or in teaching. Indeed in this stage of development, Caldwell claims his ability was as much underrated as in later years it was overrated. Hutchinson and Griffitts failed to impress Caldwell.

His habits as a student were most exemplary. He maintained an aloofness from his fellow students and followed a plan of life which reads like pages from Horatio Alger of our boyhood days. He occupied the same seat in lectures for the rather ignominious purpose of attracting his professors' attention. Particularly was he desirous of making an impression on Rush. In addition to his medical work, Caldwell read the classics and aspired to poetry and critical essays for public consumption.

His continued public notices of Rush's lectures created considerable comment in medical circles, particularly as to their authorship. By some channel Caldwell's connection became known to Rush, and through Rush's eldest son an invitation to tea at their home was tendered Caldwell. Rumor alleges that Rush made a practice of proselytizing the more promising students to his theory of practice. However, Caldwell was completely disarmed by the cordiality of his welcome to the Rush home and vastly impressed by the high standard of their conversation. Under the nom de plume, Aretaeus Jr., he continued his notices of the professor's lectures and soon began to supplement these by personal opinions of the matters under discussion. It was well known that Rush would not brook independence in either associates or students, and Caldwell was disconcerted to find an abnormal reluctance to discuss in his articles points of difference of opinion with Rush. Ultimately, however, one of his public articles contro-

verting Rush's theory of the unity of fever through a "convulsion of the arterial system" aroused the master's displeasure.

On the completion of his first course of lectures (1793) Caldwell planned a strenuous summer. When he submitted his schedule to Rush for advice, the latter protested against his lack of provision for relaxation. He undertook a course of lectures in botany and natural history under Barton; but a second course on the Brunonian doctrine of medicine was abandoned through "Dr. G's" (Griffitts?) unwillingness to defer the payment of the required fee. Clinical study at the Pennsylvania Hospital, together with scientific and medical reading, completed the work planned for this period.

The fall of 1793 with its horrible epidemic of yellow fever marks the gravest tragedy in the history of Philadelphia. Here, too, is written the most brilliant page in Philadelphia medicine. Preceded by a drought of 3 months, the pestilential flood suddenly broke loose early in August. In spite of all efforts the epidemic spread rapidly, leaving untold dead in its wake. Business was suspended. The erstwhile crowded market places were deserted, and quiet reigned save for the ominous rattle of the carts collecting the dead along the cobbled streets. Terrorsmitten, a large percentage of the population fled the city. With them passed a certain number of distinguished practitioners of medicine; but to the undying credit of the medical profession be it written that the epidemic was limited, and untold suffering relieved through the tireless devotion to duty of a less selfish majority of their fellow practitioners. Furthermore, the contributions of Benjamin Rush and others to the knowledge of yellow fever based on their experience in this epidemic were revolutionary. One member of the medical faculty, James Hutchinson, died a martyr to duty.

Had Charles Caldwell no other claim to fame, his conduct in the pestilence of 1793 and subsequent visitations of yellow fever in Philadelphia would assure him a place of honor in American medicine. Stranded by the removal from the city of two successive

landlords, the young medical student volunteered his services as a nurse, without remuneration, in Bush Hill, the pest house of 1793. As an attendant he frequently slept in the same room and even on the same bed with fever patients, which experience converted Rush from his belief in the contagious nature of the disease. The opportunity for personal advancement was not lost on Caldwell, for, on the resumption of the meetings of the Philadelphia Medical Society in December, 1793, he urged the domestic origin and noncontagiousness of the fever so effectively that he won the approbation of Rush. A division of the profession resulted on these points, and strangely, with few exceptions, those who had deserted the city in its dire need were the defenders of the theory of a foreign origin.

The session of 1793 of the medical school was opened by Benjamin Rush with his memorable lecture on the epidemic of yellow fever. He painted a vivid picture of the desolation and hardships encountered; and further his famous "ten and ten" treatment was advanced. Naturally this radical therapy of ten grains of jalap and ten grains of calomel supplemented by appropriate venesection aroused a storm of opposition.

In the controversy which resulted over these differences of opinion, Caldwell took an active part. He eagerly entered the lists of public debate with the avowed purpose to "diffuse a belief in my fitness to become, in time, a professor of medicine." Not satisfied with the ordinary course of argument, he not infrequently took the obviously weaker ground so as to improve his powers of debate—a practice which proved disastrous to him by reason of its self-hypnotic influence. Of Caldwell's diligence and sincerity of purpose there can be no question. He wrote that "a man destitute of medical literature and science, and undisciplined in composition, reading, and speaking, seated in the chair of a medical professor, constitutes one of the fittest of 'objects for scorn to point her slow moving finger at,' and for all well qualified and high-minded teachers to treat with contempt." His indefatigable study of medicine

and the classics, his analysis of the style of successful public speakers and actors and his close application to his chosen field all bespeak his depth of purpose.

About this time, Rush suggested to Caldwell the necessity for an adequate English test on physiology. Brooks and Cullen were both inadequate, and the existing translation of Haller was indifferent. To meet the demands for instruction a new translation of Haller seemed advisable; but the appearance of Blumenbach's *Physiology* rendered its utilization more logical. To the difficult task of translating this text written in German Latin, Caldwell applied himself assiduously from March to September (1794). During this period he slept only 3-3½ hours daily, and his diet was vegetarian except for milk and eggs. Broadsword exercise constituted his only relaxation. Caldwell's Blumenbach, published by Dodson, was soon followed by an English edition by Elliottson, whose subsequent editions rightly appeared under his own name by reason of his numerous additions.

The arduous spring and summer left Caldwell very much worn out; thus, the outbreak of the Whiskey Rebellion in Western Pennsylvania came as an opportune diversion. The refusal of certain distillers in this mountainous district to submit to the levying of a revenue tax on their liquors constituted the first serious test of the stability of the Federal government. Washington's prompt call of 15,000 men to arms from Pennsylvania, Virginia and New Jersey was an effective demonstration of the serious intent of the central government, and the mutinous distillers were quelled without bloodshed. Caldwell served as surgeon to one of the Pennsylvania organizations during this campaign but was given certain liberties on the line of march, which enabled him to take long tramps through the beautiful mountains along their route. Indeed, on the return trip he was virtually a free lance, appearing only at appointed places to meet his unit.

An episode leading to Caldwell's appointment as surgeon to this expedition is worthy

of recounting, since its appearance in the "Autobiography" opened Caldwell to charges of gross inaccuracy. With much gusto, Caldwell details the catching of a runaway horse—himself figuring as the hero. Chance favoring him, the occupants of the carriage whose lives he had saved, proved to be the wife and daughter of "General G-r-y." From the depth of his gratitude at the happy deliverance of his loved ones from danger, the general readily acquiesced in obtaining the desired commission for Caldwell. Unfortunately for the acceptance of this dramatic incident, General Guerney, to whom Caldwell refers, had no children by his first wife and remarried in 1793. The 9-year-old child, affectionately termed Jane by Caldwell, whose life was saved in 1794, was not born until toward the close of 1795. The unequivocal descriptions and further remarks on the ripening of their associations into friendship preclude an alibi on the ground of the child's having been merely a friend of the Guerney family. Further doubt is cast on the incident by the total ignorance of the two daughters of General Guerney of such an accident, the first intelligence of which came through Caldwell's *Autobiography*.

Returning to Philadelphia from this military expedition, Caldwell was surprised to find himself lionized; and, unable to live his customary life of a recluse, he lent himself to the social life and festivities in honor of the returning soldiers. Temporarily his ambition in medicine seems to have been lulled by the flattery of this attention from notables in public life. Ultimately, however, he came to a realization that his conceit and haughtiness toward men deemed his inferiors were alienating his associates. He asserts, "No sting penetrates so deeply, poisons so irremediably, or is remembered so interminably as that of contempt."

The breach between Rush and Caldwell, which had been threatened on the latter's public presentation of views on the unity of disease contrary to the master, was now rendered inevitable by Caldwell's resentment of Rush's utilization in lectures of his

suggestion regarding the efficacy of cold water in the treatment of fever without crediting him with its origination. Caldwell's discovery, which antedates that of James Currie, came as the result of a drenching on the march west in the Whiskey Rebellion. In a letter to Rush addressed not from Lancaster, as Caldwell states in his *Autobiography*, but from Bedford, October 20, 1794, this experience was detailed: "I was, to use a vulgar expression, wet to the skin, and had no opportunity of shifting my clothes for several hours. In consequence of this thorough bathing, and my subsequent exposure to a cool air, I was relieved from every symptom of indisposition in a few hours, and have enjoyed more than my usual stock of health ever since." This extract is contained in Rush's *Medical Inquiries and Observations* with, however, simultaneous mention of a personal experience and the quotation of Daignan's case of plague, which recovered after exposure to a rain storm. Caldwell sought redress for Rush's failure to credit him with the idea in his lectures by presenting a paper on the "Use of Cold Water in the Treatment of Fever" before the Philadelphia Medical Society. Naturally the "theory guard," as Caldwell terms the adherents of Rush's principles, rose to his defense. Reports of the circumstance alienated Rush's interest in and support of Caldwell. Never afterward did the same frankness and mutual support characterize the intercourse between these men.

On the advice of the dean of the Faculty, Caldwell omitted mention of the cold water therapy from his inaugural thesis, which was defended May 17, 1796. Notwithstanding this concession there is reported a dramatic passage of arms between the distinguished professor of the theory and practice of physic and the candidate for the doctorate degree on the occasion of the latter's examination. The thesis, "An Attempt to establish the Original Sameness of Three Phenomena of Fever," was a decidedly mediocre and inconclusive production advancing the probable unity of etiology of "Hydrocephalus Internus, Cynache Trachealis and Diarrhoea Infantum." Caldwell derived from faulty reasoning that the three conditions were "noxious and exuberant branches from the same parent stock." Wistar magnanimously admitted the fallacy of his theory of oedema as arising from the gravitation of fluids along tissue planes, when Caldwell in this thesis advanced the debilitated state of the walls of veins as the more probable cause. Aside from this improved concept, any merit residing in the thesis lies in an interesting clinical observation on the diarrhea of children. It "prevails only during the summer and the earlier part of the autumnal season; and seldom appears save in the foul and heated atmosphere of a crowded city. The pure and breezy air of country situations remote from marshes or other large bodies of stagnant water, so far from giving origin to this melancholy disease, affords the most efficacious remedy to such children as have already become the unhappy subjects of its violence."

According to Caldwell, Rush sought to interrogate him on the passage in his thesis as to the relief of fever by cold water, which had been deleted. Provost Ewing overruled Rush on this point. And then, after a rather heated passage of words, Caldwell denounced Rush for using a spurious copy of the thesis. Rush, beside himself with rage, is reported to have asked, "Sir, do you know who I am, or who you are yourself, when you presume thus arrogantly to address me?" To which Caldwell answered, "Know you, sir? Oh, no; that is impossible. But as respects myself, I was this morning, Charles Caldwell; but indignant as I now am at your injustice, call me, if you please, Julius Caesar or one of his descendants!"

Some doubt is cast on Caldwell's account of this episode by reviewers of a contemporary period. For example, Samuel D. Gross ridicules even the thought of this effrontery to such a well-poised dignitary as Benjamin Rush. Another points to the improbability of a man of Rush's station being discomfited by a mere student; but regardless of the accuracy of Caldwell's narrative, it is a

matter of historic record that Rush refused to sign his diploma until Caldwell apologized. Nor did he weaken in this resolution until importuned to overlook the matter several years later by David Rittenhouse.

The period following graduation found Caldwell active in practice and in the proceedings of the medical societies. He joined fortunes with the group of medical men splitting from the College of Physicians to form the Academy of Medicine. With Philip Syng Physick as president, Caldwell served as vice-president of this organization in 1798. He was re-elected to this office in 1799. In the proceedings of the College we learn that Charles Caldwell lost his fellowship in that body on January 4, 1803, because of nonpayment of dues for 3 years. Caldwell's agitation, through the public press and medical channels combined with the efforts of Physick and Rush, resulted in the introduction of Schuylkill water into Philadelphia. The project was started in 1797 and completed in 1801. This rather extravagant system was replaced by a more economical plan in 1819 (Addendum A).

*Addendum A.*—The incorporation of the Delaware and Schuylkill Canal Navigation Company on April 10, 1792, represents the first comprehensive project to supply Philadelphia with water. Its plan to carry water by a canal along the east bank of the Schuylkill from any point below Norristown was finally abandoned as impracticable. However, the recurrence of yellow fever epidemics led to repeated petitions to the Legislature and City Councils for an adequate water system. Benjamin H. Latrobe proposed to pump water from the Schuylkill throughout the city by means of a steam engine. His plan won in the face of vigorous opposition, and in 1801 water was delivered to hydrants in various parts of the city through wooden pipes. In 1815 the water works were moved from Chestnut Street to Fairmount. Wooden water mains proved very expensive, and their replacement with iron ones began in 1818. The water system of Philadelphia was further improved by the completion of the dam and the waterwheels in 1822.<sup>1</sup>

<sup>1</sup> Abstracted from Current Topics, *Public Ledger*, Philadelphia, August 14, 1919.

During the trying period from 1793 to 1805 when yellow fever was constantly sporadic and seven times epidemic in Philadelphia, Caldwell was three times affected by the fever—"each successive attack," he remarks, "less severe than the preceding." The first of these attacks, in 1797, succeeded a period of marked literary activity in defense of Rush who was being shamelessly attacked for his advocacy of the local origin of the fever and his treatment thereof. By disguising his style and by swearing the editor to secrecy, Caldwell kept Rush in ignorance of the authorship of these articles—a circumstance which scarcely savors of sycophancy. Caldwell's illness brought this series of articles to a sudden termination, and Rush, by this time suspicious of their origin, traced them to his door. With Physick, Rush attended him through this serious illness. The gingivitis resulting from his mercurialization persisted until all teeth were lost by 1836. This local condition, however, in no way affected his general health, and Caldwell further vindicates the use of large doses of calomel in yellow fever, since it induces an "artificial cholera morbus" thereby "converting centripetal into centrifugal action."

Caldwell's observations on yellow fever are worthy of consideration. With the current belief of the day, he agreed that the pestilential fever was a severe form of autumnal fever. It arose from the putrid miasma of marshes or decaying materials. Then, too, he held that meteorological irregularities of one kind or another were predisposing factors in the development of epidemics of yellow fever. His personal experience led him to reject the contagious theory of the spread of the disease; yet he urged people to sleep above the level of the pestilential effluvia. His admonition to avoid night air was an unconscious step in the right direction. Without attributing a causative relation, Caldwell remarked on the swarms of insects, particularly mosquitoes, appearing concomitantly with the yellow fever. He felt that the insects were, as the fever, dependent on the putrid exhalation for their multiplication.

Caldwell entertained rather advanced

views on quarantine regulations. As a member of the Board of Health, he was instrumental in having the inordinate period of quarantine of vessels at the Lazaretto reduced to the interval just necessary to properly cleanse the ships and to inspect passengers and cargo. This plan was later subscribed to by New York, Boston, and Charleston. His essay on quarantine won the Boylston prize at Harvard in 1834. The rigorous quarantine in countries surrounding Spain, when an epidemic arose in that country, evoked the following characteristic expression of sentiment from Caldwell: "Unless the pestilential constitution which appears to prevail in their atmosphere be done away; or a system of domestic cleanliness be rigorously enforced, as well might those nations attempt to countermand the laws of planetary attraction, or to stay, by the military guards, the course of the angel that rides on the whirlwind, as to set limits to the ravages of this calamity."

Organizations for the civic betterment of Philadelphia would do well to consult the *Memoirs of Charles Caldwell* published in 1801 for comprehensive suggestions in city planning and sanitary reform. He scores heavily the avarice which led to an abandonment of William Penn's plan for an ideal city. Particular reference is made to the congested river front, which by Penn's wise provision had been eliminated to afford Front Street on the high river bank a beautiful outlook over the Delaware.

Deceitful shortsightedness and cupidity frustrated this plan, and Water Street with all its filth and squalor became the hot bed of disease. Caldwell urges the replacement of decaying wooden wharves by substantial and hygienic stone structures. The paucity of public squares and shaded walks is deplored. Inspection of slaughter houses and their removal from the crowded city are advocated. The filthy state of sewers, gutters, and alleys is deemed scarcely conducive to good health. Caldwell points out that as early as 1762 Thomas Bond, in a lecture at Pennsylvania Hospital, had warned that the filth of the city was capable of producing

yellow fever. The unsanitary condition of graveyards and privies is declared appalling. The unhygienic state of Philadelphia at that time was in large measure due to the ill-founded complacency arising from the theory of the foreign origin of yellow fever.

To Philadelphians the following plan for the improvement of the League Island district has a most prophetic tone:

The clearing, draining and cultivation of that neighbouring and marshy tract of country, denominated the 'Neck,' is a measure calculated to improve the health of our city.

Lying but a short distance to the southward of Philadelphia, and giving origin formerly to an immense volume of marsh miasma, this subtle poison must have been necessarily conveyed to the city by the autumnal winds.

The cultivation of the soil has not only given a check to the generation of this poison, but has covered the surface of the earth with an abundance of vegetables, which absorb and convert it to their own nourishment. For vegetables act as the scavengers of the atmosphere, clearing it of such gases as are hostile in their nature to the health of man.

An additional step might yet be taken to give us greater security against the influence of the deleterious air in question. Were several adjoining lots to the southward and westward of the city, converted into a park or public garden, and covered with grove and forest trees, these lofty plants would not only aid the inferior vegetables in devouring miasmata from the neighboring marshy grounds, but would also act mechanically in arresting the winds, which mingle this exhalation with the atmosphere of our streets.

As an essay on civic betterment and public sanitation, this work deserves a high rank. Were it not for the fact that the author at times sacrifices substance for rhetorical effect, the notice received would have been greater and the good achieved more lasting.

Caldwell belongs to that progressive group of American physicians who early put vaccination to the practical test of personal application. In a letter under the date of July 22, 1802, addressed to Lyman Spalding, Caldwell says that his personal experience with "Kine Pox," substantiated by that of

his friends has been "sufficient to convince them of the power of this disease (if it deserve so harsh a name) to eradicate from the System a Susceptibility of Small Pox."

In 1803, Caldwell introduced clinical instruction into the Almshouse. He was not, however, as has been erroneously quoted, the first teacher of clinical medicine in Philadelphia. As early as 1766, Thomas Bond had delivered clinical lectures in the Pennsylvania Hospital. Caldwell seems to have submerged his differences with Rush at this stage of his career, and for a time their relationship was more tolerant. He lost no opportunity of improving his mind or his teaching qualifications. With Rush's permission, he followed the professor through the wards of Pennsylvania Hospital giving bedside instruction to such students as were interested.

At Rush's instance, the editorship of the "Thesaurus Medicus," a compilation of theses defended by graduating students, was assigned to Caldwell. Primarily, Barton and Woodhouse, two junior faculty members, had been delegated to this task. Lack of co-operation and application between these two permitted the work to languish (Addendum B).

June 27, 1804

*Addendum B.*—"I do solemnly certify that some time towards the close of the year 1802, or early in the year 1803, Dr. Woodhouse signified to me in unequivocal terms, (and spoke with considerable warmth on the occasion), that a volume of medical Theses, to the selection and superintendence of which Dr. Barton and himself had been appointed by their colleagues, the medical professors, would never be completed. I forbear relating the reasons which he assigned for this, as a promulgation of them would not be well calculated to promote harmony between him and Dr. Barton. What led to a conversation on this subject was, a failure on the part of Dr. Barton to comply with an engagement into which he had some time previously entered with Dr. Woodhouse and myself, to join in conducting a work somewhat on the plan of the Medical Repository.

I do further certify, that as late as last winter (I think it was in the month of February) Dr.

Woodhouse told me, that in case of his meeting with an opportunity which might please him, he would probably make a visit to Italy during the present summer. A voyage to a distant country is not very compatible with the confinement and drudgery of an editor in the United States."

CH. CALDWELL

The first volume appearing under Caldwell's guidance in the autumn of 1805 was accorded a gratifying reception by the profession at large. His personal contributions to this volume on the "Vitality of the Blood" were lauded by Lettsom, Darwin and Beddoes. These observations on the blood were in truth elementary. As criteria of the vitality of the blood, he considered stimulability and the power of self-preservation. To derive these data, age, exertion, gases and physical measures, as electricity, were studied with relation to their influence on coagulation and putrefaction.

The opposition of Barton and Woodhouse led to the failure of the second volume in 1806. Furthermore, they engineered a movement among the students complaining of the unnecessary expense of the publication of their theses. In turn the faculty and trustees voted against the continuance of the "Thesaurus."

This circumstance was not, however, the primary source of friction between Caldwell and Benjamin Smith Barton, successively professor of botany and natural history, of materia medica, and lastly of the theory and practice of medicine at Pennsylvania. Caldwell dates this feud to the plagiarism of his theory of the loss of pigment in a full-blooded negro, Henry Moss by name, who was attracting wide attention in scientific circles in 1795. Barton had averred that the phenomenon was due to undue sweating. Later, however, he accepted as his own Caldwell's explanation that the bleaching was due to a loss of the rete mucosum. Furthermore, Caldwell exploded the preposterous theory of the winter retreat of swallows entertained by Barton. On rather circumstantial evidence, the latter had taught that swallows hibernate in the mud at the bottom of lakes

or in tree stumps. Then, too, Barton's miasmal theory of the origin of goiter fell under Caldwell's attack. In this refutation, his strongest point was made in calling attention to the absence of malaria in Switzerland, the most goitrous country.

In Caldwell's personal estimation of Professor Barton, there are strange discrepancies between his *Autobiography* and his papers contemporaneous with Barton's life. Aside from a comment on his enthusiasm and the credit due his introduction of botany into the study of *materia medica*, references to Barton in the *Autobiography* are most depreciatory. In the *Memoirs* (1801), on the other hand, Caldwell ranks Barton as one of those "characters conspicuous for their talents and philosophical attainments." At that time his writings were characterized by "variety of matter and simplicity of manner—that richness and perspicuity." Such was Caldwell's consistency!

At Rush's suggestion, Caldwell made a translation of Senac's "Treatise on Remitting and Intermittent Fevers." In the dedication of this volume to Rush, he expressed the following felicitous feeling toward the master:

But I am actuated, also, by other considerations, which though more private and personal in their nature, are not with me less powerful in their operation. These considerations, were they to be even rejected by the judgment, would appeal to the feelings, and though repulsed from the head, could never fail to gain admission to the heart.

During an intercourse of some continuance, particularly during my medical pupilage and the first years of my practice as a physician, I received from you many acts of attention and courtesy, which as a young man and a stranger in the place, impressed me deeply at the time, and have still continued to be sources of grateful recollection. Out of these civilities, obligations naturally arose on my part, which our present situation has not yet allowed me to cancel. It is even possible that an opportunity of cancelling them may never occur. I must, therefore, beg your acceptance of this dedication of some acknowledgment of them, accompanied by my sincere wishes for a long continuance of your health, happiness and useful labors. For how-

ever grateful, in the evening of life, the *otium in secessu honestum* may be to a philosophical and contemplative mind, I am unable to wish you such a retirement. It is enough that we should be deprived of your labors and services when you have gone to enjoy the reward of them in a better world.

October, 1805.

CH. CALDWELL.

Again in his history of the epidemic of yellow fever of 1805, Caldwell is most laudatory of his teacher. However, certain developments renewed the gap between them, and friendly intercourse was never again resumed. Caldwell believes this coolness to have resulted from his independence of thought and action. However, Rush's announcement of the opposition of certain faculty members to Caldwell and the improbability of his election to the chair of medicine at Pennsylvania would seem the more logical explanation for the break. Caldwell thus relates Rush's message: "Of your talents, attainments and powers in lecturing and instructing, they speak in the most respectful and flattering terms. But they are reluctant to recommend you to the Board of Trustees, in the light of a professor." A plan to divide the chair of medicine into the theoretical and practical branches, as advocated by Caldwell, was defeated.

Stung to desperation by the frustration of his plans, Caldwell first considered a professorship proffered him in the new school at Greenfield, New York, and later a chair in Baltimore. Unmindful of his injunction that "whatever injures the standing of the mother, falls like a blight on that of her children," he seriously contemplated the establishment of a new medical school in Philadelphia. Apparently he was only deterred in his plan by the dearth of kindred spirits to assist him in the project. It is interesting, by way of contrast, to note the following quotation from his "Thoughts on the Impolicy of Multiplying Schools of Medicine" delivered in Lexington some 30 years later: "The selfish passions of envy, resentment, ambition, or the desire of distinction of a few individuals, should have no concern in their

establishment." What a radical change of view!

Failing in his efforts to establish a new school of medicine, Caldwell next instituted a series of public addresses with the avowed purpose of refuting some theories cherished by Rush. He persisted in this campaign of iconoclasm against the strong opposition of his friends. His first attack was on the Brunonian hypothesis of life, which with certain reservations had been adopted by Rush. This doctrine, the product of the dissolute ingrate, John Brown of Scotland, deemed life to exist only as the manifestation of reaction to external stimuli and classified diseases on this basis as sthenic or asthenic. With all its vulnerable points it naturally offered a pregnable mark for Caldwell. However, one is surprised to find from time to time obvious adaptations of this principle to Caldwell's teachings. For example, in his *Memoirs*, with reference to yellow fever, he states that it is a disease of excessive action, produced and continued by an excess of external stimuli. He concludes that it should therefore be treated by sedative or evacuant drugs.

Several days after his Brunonian lecture Caldwell attended a lecture in chemistry by John Redman Coxe. At the close of this lecture certain students manifested their displeasure at Caldwell's presence by hissing. Coxe, under the impression that the affront was meant for him, was disconcerted until Caldwell's name was called. In his account of the incident, Caldwell relates that he moved in the direction of the voice, saying: "I know of but three sorts of vermin that vent their spleen by hissing: an enraged cat, a viper and a goose, and I knew not till now that either of them infested this room." His further elaborations of the episode are termed "deceitful reveries" by an eye witness. Indeed doubt is cast on the depth of Caldwell's emotion at the time of the unpleasantness, when he is reported to have remained unruffled and as he strode contemplatively over the benches to have remarked to the professor unconcernedly, "No animals hiss except snakes and geese."

Unsuccessful in securing a teaching position in the medical school, Charles Caldwell continued his attacks on Rush. In 1809, he rented a room close by the school in Market Street, above Ninth and advertised his lecture courses by stationing a servant at the entrance to the University with hand bills (Addendum C). The first few lectures were

#### Addendum C.—

This afternoon immediately after Dr. Physick's lecture at the County Court house, South East Corner of 6th & Chestnut Street.

Dr. Caldwell will lecture on

Lunar influences in producing diseases.

The lecture to conclude with some new views on the subject of menstruation.

The medical class in general is invited to attend. Please to make this notice public.

Monday, January 8, 1810.<sup>2</sup>

well patronized, and then attendance waned markedly. Finally Caldwell moved to less presumptuous quarters in the Second Street Market House. A student of that period reports that with one other he formed an audience at one of the lectures there given. Shortly Caldwell gave up his attempt at private teaching, only to resume it in another luckless attempt after a short time. Letters of this period reveal his vexatious frame of mind (Addendum D).

July 14, 1812.

*Addendum D.*—You ask, what, medically speaking, we are doing in this city. I answer: Nothing. Nothing, I mean, towards promotion of the medical literature of our country. For at least six months past, so completely nauseated have I been with the sycophancy and subserviency of our physicians to the dogmas of a certain character (who, a footnote relates, was good Dr. Rush, detested for success and universal admiration—Ed.) whose name I will not, because I need not mention, that I have, during that period abandoned medical reading as well as writing, and mused myself with polite and classical literature (*Life of J. Smith* and one of *Commodore Barry*). It is

<sup>2</sup> Among Lyman Spalding's papers, was found this notice of Caldwell's lecture, posted at the entrance to Dr. Physick's lecture room (Words from "Lunar" to "Menstruation" were written in.) The handwriting is like Caldwell's.

likely, however, that the winter will bring me back to my former habits.<sup>3</sup>

With a rankling in his soul, this contentious Tom Touchy of Philadelphia medicine drifted from one controversy to another. In 1848 he confessed that "never since the year 1793 until the present date, have I been free from a contest against some opinions or doctrines which I consider erroneous." He seemed unable to eliminate the personal element from these controversies. His attack on Dr. Thomas Sewall in "Phrenology Vindictus" was particularly vituperous (Addendum E). Although justifying the charge

*Addendum E.*—Dr. Sewall's two lectures . . . were conceived about the year 1825 and 1826. Ever since that period, the Professor has been in protracted, and no doubt painful gestation and parturition of them; and his safe delivery is but of recent date. What less then could he expect of them, than that they would issue from the travail of his aching brain, like Minerva from the brain of the ruler of Olympus, adult in stature, full fraught with wisdom, "clad all in steel," and prepared for the highest and deadliest doings! And how miserable must be the disappointment, and how piteous the condition of the doating parent, when he shall find that instead of giving birth to a paragon of wisdom and war, he has incurred "the sharp toothed" sarcasm of the satirist: "*Montes parturiunt, et mus ridiculus nascitur!*" And the mouse shall be forthcoming.<sup>4</sup>

of plagiarism against Sewall by the "deadly parallel" yet his personal affronts were unjustifiable and abusive.

One of his most unfortunate contentions was with the learned President Smith of Princeton. In answer to that distinguished clergyman's essay on "The Causes of the Variety of Complexion and Figure of the Human Species," Caldwell launched a vehement critique, in which he maintained that climate and environment were incapable of inducing the differences of the various races. Smith resented this attack, and

<sup>3</sup> Dr. James Alfred Spalding, "Life of Lyman Spalding," Boston, 1916.

<sup>4</sup> Chas. Caldwell, "Phrenology Vindicated in a Series of Remarks, Physiological, Moral, and Critical," November, 1834, *Christian Economy*.

his early death was attributed by his friends to the bitterness of Caldwell's arraignment.

On one occasion, Haygarth of Bath aroused Caldwell's wrath by presuming to criticize the latter's address on the laws controlling epidemic diseases, delivered before the Academy of Medicine of Philadelphia. Caldwell, when rebuked by Lettsom of London for his inconsideration of Haygarth's age, stated that Haygarth had observed "neither delicacy, decency, nor truth," and was therefore unworthy of consideration. This incident alienated Haygarth, but Lettsom continued his correspondence with Caldwell.

Nor were all his controversies confined to matters medical. In 1803, Thomas C. James, by common estimate "an amiable, gentle and accomplished gentleman" who will be recalled as the first systematic teacher of obstetrics in America, accused Caldwell of altering the figure and date on receipts from the treasurer of the College of Physicians. He appealed to the governor of Pennsylvania to have Caldwell relieved from the Board of Health. Both were members of the staff of the Philadelphia Almshouse at the time; but its managers refused to be involved in a purely personal squabble. However, at the next election of staff physicians, Caldwell was dropped, and James continued in office. Notwithstanding the action of the Board, Caldwell was still permitted to continue his clinical rounds and to teach in the hospital. James's early resignation from the staff leaves the question of equity open.

Caldwell's account of the circumstances surrounding the death of Benjamin Rush on April 19, 1813 is most garbled. His insinuation that Rush died by his own lancet, is dispelled by James Mease who was present when Rush died. Dr. Mease, with Dorsey, Griffitts, Physick, and James Rush, attended him in his last illness. Furthermore, Caldwell's divergent accounts of the circumstances surrounding Rush's death present an interesting study.

It is hard to reconcile the following diametrically opposing pictures as products of the same pen. In Caldwell's *Autobiography*

it is stated, "Nor was the door of his dwelling surrounded during his illness by crowds of anxious and sorrowing inquirers after his condition, and the prospects of his recovery." Further, "No cloud of woe descended on the city sufficiently deep and dark to indicate the death of a great man, who had long been the pride and boast of the country—who had figured as a distinguished Revolutionary patriot, whose life had been a galaxy of the labors and deeds of philanthropy, and who had been for forty years the acknowledged cynosure of American medicine." From Delaplaine's "Repository of the Lives and Portraits of Distinguished American Characters," of which Caldwell was editor, we learn that "since the death of Washington, no man perhaps in America, was better known, more sincerely beloved, or held in higher esteem. Even in England, the tear of sensibility descended on his ashes and the voice of eulogy was raised to his memory." . . . "For nearly 3000 years past, but few physicians equal in greatness have appeared in the world; nor is it probable that the number will be materially increased for ages to come." Caldwell's subsequent effort at retraction on the ground of a temporary submergence of his better judgment in deep emotion, is inadequate in view of the effusive scope of his panegyric. His statement that no eulogist could be obtained to prepare a notice of Rush's death is apt to be misleading, unless one realizes that the only available speakers of prominence, Chapman, Caldwell and Barton, were all personal enemies of the deceased. Ramsay of Charleston, wrote the only contemporary notice of Rush's death.

One of the inexplicable incongruities of Caldwell's life was his unwavering friendship for Nathaniel Chapman, who was virtually Rush's successor in the chair of medicine at Pennsylvania, Barton serving in this capacity for only two sessions. Naturally one would have anticipated a preconceived aversion on Caldwell's part to the man who was to attain the high position to which he had aspired in vain. Yet Chapman and Caldwell were the Damon and Pythias of a stormy

period in Philadelphia medicine, full of politics and intrigue—Gross to the contrary, notwithstanding. A fellow spirit existed between the two, as evidenced by this sentence of a letter from Caldwell to Chapman, "It is certainly true that as teachers and disputants, we have for many years held our station in the first rank of battle." Chapman admitted that his election over Caldwell had depended in a large measure on the friendship of the Board of Trustees. Furthermore, the frankness in admitting Caldwell's superior qualifications and in enlisting his aid in the preparation of his early courses apparently won Caldwell's undying allegiance. In 1816, at Chapman's request, Caldwell prepared an American edition of Cullen's "First Lines of the Practice of Physic," and as evidence of his sincerity Chapman used it as the text in his courses for 10-12 years. In Caldwell's words, Chapman filled the chair of medicine "with a degree of ability and distinction which neither praise can brighten nor condemnation make dim." "The professor's reputation is now an electron *per se*, that shines with no borrowed light, but with an innate luster, which makes an element of itself. And as a man he ranks with the most high-minded and honourable of our race."

Caldwell was much in demand as an orator on state occasions. It is recorded that "he spoke in long, well rounded periods, and in a great sonorous voice." Gifted with magnificent physique and commanding presence, "he was a model of a lecturer, walking to and fro upon the platform like a caged lion. He had practiced oratory before the mirror, possessed fine powers of elocution and had a mind well stored with professional and general information." One of his numerous public addresses of this period was an eulogy of Caspar Wistar. In spite of his personal high estimate of the effort, an auditor, Dr. Horwitz, reported to Lyman Spalding that the oration was better adapted to Bunker Hill than to the occasion of a death notice, and the speaker's style to a soldier than to a physician. Reference in this address to a successor to Wistar in their midst (Dorsey) has been construed to con-

stitute duplicity on Caldwell's part, since he was said to have encouraged the candidacy of Lyman Spalding. In its published form the eulogy contains no such remark, so that the reported passage probably represents merely the extemporaneous effusion of the speaker. In the correspondence between these men (Addendum F) Caldwell frankly

*Addendum F: Caldwell's Letters to Lyman Spalding.*—

Dear Sir:

I have delayed replying to your last letter until I should have something to say, on which reliance might be placed.

Dorsey will, I apprehend, ask for the chair of Anatomy. If so, all competition may cease. He will certainly carry it from any competitor. It would afford me pleasure to serve your interest in that or any other respect. But where there is no chance of success, it would be uncandid in me to offer any encouragement.

From my friend, Mr. Reuben Haines, who will be in New York in a day or two, and whom I beg permission to introduce to your acquaintance, you will receive a copy of an Eulogium, I had the honour to deliver, a few days since, to the memory of poor Wistar.

My time was too short and otherwise too much occupied, to do justice to the subject; which indeed, no time, perhaps, would have enabled me to do. Such of the performance is, however, I beg you to accept it, and to believe me, in perfect truth,

Dear Sir,

Your friend and obedient servant,  
Philada., March 3rd, 1818. CH. CALDWELL.

Philada., Nov. 16th, 1818.

Dear Sir,

Let me hasten to inform you that arrangements are already made for Dr. Physick to supply the vacancy in the Anatomical chair of our medical school, during the present session.

On the subject of a permanent successor to that chair, nothing is yet done and, as far as I know, but little thought of.

I shall, notwithstanding, have the pleasure of making known the purport of your letter, conformably to your request.

Should any determination in your favor be made, intelligence shall be communicated to you without delay.

Present me to Mrs. Spalding, and believe me, very sincerely,

Your obedient servant,  
CH. CALDWELL.

admitted the strength of Dorsey's position and the futility of competition, were he a candidate for Wistar's chair. However, at the same time Caldwell was known to have supported the candidacy of Warren of Boston for the vacancy.

Caldwell's literary bent determined his succession to Nicholas Biddle as editor of the *Port Folio*. This monthly journal attained a position of national prominence during the War of 1812 by reason of the semi-official accounts of military and naval affairs personally reported by prominent officers in both branches of the service. Furthermore at intervals, biographic sketches of notables in civil and military affairs made their appearance in this periodical. In 1819, Caldwell published his *Life and Campaigns of General Greene*, which was vigorously reviewed in the *North American Review*. A valuable biographic compilation of this period, Delaplaine's *Repository of the Lives and Portraits of Distinguished American Characters*, was edited by Caldwell and still constitutes an important historical reference.

In 1810, he instituted a course of lectures on medical jurisprudence; these were among the first delivered on this subject in America.

The establishment of a faculty of physical sciences in 1815 created a chair of geology and the philosophy of natural history, which Charles Caldwell sought as is evidenced by his letter to Lyman Spalding requesting a recommendation for the place. Whether a sincere desire to utilize Caldwell's talents as a teacher, or, as he suspected, an effort to prevent the diversion of students from Philadelphia by his proposed removal to the West, prompted his appointment is immaterial. His was an unruly tongue, and it is possible that this professorship may have been granted as a placebo to placate his ruffled feelings. Of the appointees to this faculty, only Cooper and Caldwell delivered the proposed courses of lectures, which were semipopular and attracted large and appre-

ciative audiences from the city. Four courses were given in the 3 years of Caldwell's occupancy of the chair.

In a letter to Dr. Brown of Lexington, Kentucky, Caldwell urged the advisability of establishing a medical department at Transylvania University. This letter, presented to the Board of Trustees, was favorably acted upon. As a result, Caldwell was called to the chair of the institutes of medicine and clinical practice in August, 1819. His appointment was in a measure enhanced by the favorable impression made by his Wistar eulogy on President Holley of Transylvania. Caldwell left Philadelphia, October 6, 1819. He remarks that, on his arrival in Lexington, he found the country as barren medically as Boone had found it agriculturally in the pioneer days. Caldwell was made the dean of the medical faculty, which constituted three "medical ciphers" and a fourth more useful professor, Dudley, who, though less talented, was a good worker. On the occasion of his inaugural speech, Caldwell was addressed by President Holley and answered him in Latin—"an expedient not without a salutary effect." In the body of the address, which was delivered in English, Caldwell developed the subject of the necessity and advantages of a school of medicine in Lexington.

Handicapped by lack of funds, books and essential equipment, Caldwell appealed to the Legislature at Frankfort in January for 10,000 dollars. One half of this sum was granted, and it was further supplemented by 6,000 dollars from the citizens of Lexington. The summer of 1823 was spent in propaganda work for the support of the new medical school. He toured the Mississippi Valley and adjoining states in search of candidates for admission. He also visited Philadelphia and New Orleans to secure materials and equipment for instruction during the next session. The second class was twice as large as the first, and by the session of 1826, Transylvania had attained the position of the second largest medical school in the United States.

Between the second and third sessions of

the Medical Department of Transylvania University, Caldwell went abroad in search of books and materials for teaching. His observations on the personalities of notables with whom he came in contact are most interesting. In characteristic style he describes the elegant, impressive Sir Astley Cooper, whose mental attainments were, in Caldwell's opinion, beneath his reputation. The brusque John Abernethy, on the presentation of a letter of introduction, rebuffed Caldwell and was taken aback by Caldwell's prompt and unceremonious withdrawal. Piqued by what he termed "quick-on-the-trigger" behavior, Abernethy, nevertheless, made due amends, and they parted friends.

France had not yet recovered from the disorder of her Revolution at the time of Caldwell's visit, and this circumstance facilitated his quest of medical literature. Rare and valuable editions either by the looting of libraries or the grim pressure of poverty had found their way to lowly bookstalls. However, aside from his unexpected success in this direction, Caldwell enjoyed a wide social and medical acquaintanceship. Among his medical associates may be mentioned Cuvier, Dupuytren, Baron Larrey, and Alibert; letters to LaFayette, Marquis Marbois and Marshal Grouchy also gave him social entrée.

The session of 1836-37 was a stormy one at Lexington. Two years after Caldwell's forceful address on the "Impolicy of Multiplying Schools of Medicine," in which he had denounced the possibility of Louisville as a medical center, he was engineering a movement to transplant the medical faculty from Transylvania to that city. The slow growth of Lexington was urged as a leading argument to effect this move. The secret agreement of the faculty to his plan met an unexpected obstacle in Dudley's announcement that anatomical materials would not be available in Louisville. An open split in the faculty resulted, and Caldwell was the scapegoat. Those who had broken faith with him openly contested the project, while his adherents hid behind him and gave him no open support. In his valedictory of March

15, 1837, Caldwell vigorously attacked Dudley, who in turn brought charges of conspiracy against his assailant. Failure to respond to the summons of the Board of Trustees resulted in Caldwell's official dismissal from the faculty, a formality rendered pointless by his removal to Louisville some time previously.

Facilities for medical instruction were very limited at Louisville. Furthermore, the Louisville Medical Institute was openly opposed by the medical schools of Cincinnati and Lexington. Yet turning his back to his assured position in Lexington and flattering offers from Cincinnati, Caldwell chose to face the obstacles necessary for the establishment of a new school in Louisville. Again he carried the question of the financial support of the project to the townspeople. They subscribed 20,000 dollars of the 25,000 dollars requested. After consultation with the Board of Managers, Caldwell was assigned to the chairs of the institutes of medicine, medical jurisprudence and clinical medicine, and Miller to the chair of obstetrics. Later, on Caldwell's recommendation, Yandall was appointed to the professorship of *materia medica*; Cooke, to the theory and practice of medicine and Mitchell, to chemistry. In the East, Caldwell induced Flint to join the faculty, but he proved inefficient through lack of application. An affiliation of Louisville Marine Hospital with the Medical Institute was effected by Caldwell. Then at his own expense he went to Europe in the interest of the school, and from personal funds procured considerable materials for medical instruction.

Appreciating in a measure the disadvantages of his age, in 1846 Caldwell confided his financial circumstances to the individual members of the Board of Managers, and indicated his desire to retire in 1850, by which time certain business arrangements would have materialized to assure him a comfortable income. Apparently he was ignorant of the resolution of the Board to dismiss him in 1847, which had only been defeated by the active opposition of Henry Miller and Samuel Gross. Unwilling to defer this action

longer, in 1849, against the urgent counsel of his friends in the faculty, Caldwell was discharged by the Board. Naturally the old gentleman scented intrigue and charged Lunsford Pitts Yandall with leading a conspiracy against him, the basis of the plot being professional jealousy. Caldwell involved Henry Miller, Samuel D. Gross, Charles Short, Jedediah Cobb, and Daniel Drake in this cabal. Of the last mentioned, he says "a gentleman very highly and justly distinguished for his powers of mind and useful attainments; and unfortunately not less so for his propensity to strategy and intrigue, which marred his usefulness and darkened his fame."

His attack on Yandall charged duplicity, mediocrity, and scheming to advance personal ambitions. Most of Caldwell's accusations are refuted in Yandall's answer by direct quotations from Caldwell himself. Furthermore, the constitution and by-laws of the medical faculty, to which Caldwell had subscribed contained a clause of majority rule and set the age limit at 65 years. Yandall then showed that Bartlett had been the first nominee for the vacancy created by Caldwell's dismissal.

In desperation and chagrin, Caldwell vainly sought reparation in public debate with any professor in the institute on any subject. The querulous old man interrogated members of the faculty on the cause of his removal, and age was the only reason assigned. He spurned the proffer of any academic honor from the medical school. According to Gross, he left Louisville to establish himself in Nashville where he attracted a small following; but no mention of this change of residence is found elsewhere.

The views regarding Caldwell's ability as a teacher are widely divergent. Samuel D. Gross affirms that, while he was well liked by the students, he was a poor teacher. In his teaching, he supplanted medicine by philosophy and phrenology. Furthermore his methods were 25 years behind the times. Gross adds: . . . "I doubt that he ever made a physiologist of any of his pupils. He was a disclaimer, a speculator, not up to the

existing state of science, notwithstanding his learning, and he was therefore a miserable teacher." Lunsford P. Yandall, a favorite student at Lexington in 1823, but scarcely an unbiased witness in later years, remarks that Dudley and Drake were even then more popular teachers than Caldwell. "Students, in truth, generally turned listlessly away from his polished discourse on Sympathy, Phrenology, and Vital Principle, and other kindred themes, and hurried off to the lectures on Materia Medica and Anatomy." Years seem to have mollified Yandall's natural resentment toward Caldwell's attack, and he later (1875) refers to his old patron as possessing qualities of person and mind "rarely equalled by a teacher of medicine." Juettner declares that "Caldwell was distinctly a man of prejudice, very voluble and with a marvelous facility for eloquently getting away from any subject he was discussing." On the other hand, David W. Yandall states, "He taught the physiology of his day, which was then largely the physiology of the ancients, but he taught it in so impressive a manner that his classes received it as gospel and voted him its greatest expounder." The testimonial of his last class at Louisville is a real tribute to his ability as a teacher (*Addendum G*).

Louisville, March 6, 1849.

*Addendum G.*—We, the undersigned, members of the graduated class of the Medical Department, University of Louisville, for the session 1848 and '49, unanimously adopt the following preamble and resolutions:

Whereas, we have attended the lectures of our venerable Professor of the Institutes of Medicine for two sessions; and whereas, in all human probability, he will not continue many years longer to hold his place in the University, which we are proud to cherish as our alma mater; therefore—

*Resolved*, 1st. That we feel it to be our privilege and take great pleasure in expressing our high regard for him, as a man of profound learning, and one of the ablest advocates and most efficient teachers of the medical profession.

*Resolved*, 2d. That his lectures on all the subjects pertaining to his chair, have been able,

thorough, and instructive; and that the imputation, therefore, that he is superannuated, or that his lectures are, in any way inferior to those of the other professors, is unjust, unfounded, and false.

*Resolved*, 3d. That, in consideration of the deep interest he has always manifested in our advancement in the study of the philosophy of medicine and his untiring efforts to promote the same, we deeply regret the prospect of his vacating his chair, which he has so long and so ably filled; and for his courteous and affable manners to us as pupils, and all the kind attentions we have received from his hands, we tender to him the grateful thanks of his affectionate pupils and humble servants.

Signed in behalf of the class by

W. W. McCOMAS

J. RODMAN

F. L. MADDEN

Caldwell's views on medical education, while in the main the product of the day, are quite interesting. He maintained that only men trained in a certain district were capable of treating the diseases of that neighborhood. While admitting the advantages of hospital experience to small resident classes, he adds that "in whatever light it may be viewed, hospital practice, held out, as a lure to attract a larger winter class, is a dishonourable hoax." The establishment of new schools would lead to a reduction in the size of classes; and he states, "It may be received as a maxim, that a medical school discouragingly limited in its classes, will be correspondingly limited, not to say actually superficial in its teaching, and cannot therefore be the parent of accomplished physicians."

Converted to a belief in phrenology by Gall and Spurzheim on his visit to Paris in 1821, Caldwell introduced this fallacious principle into medicine in America. At one time he remarked that through the study of phrenology "mankind at large are destined to receive, through all coming time, benefits and blessings of a magnitude and multiplicity which no human sagacity can compute." Caldwell advocated trephining in the treatment of mania on the basis of phrenology. He lived to see the whole fabric discarded.

Strangely, Caldwell was a disbeliever in chemistry which he termed "that speculative science," a flight of fancy and a lineal descendant of alchemy. He remarks, "Even at the present day it is hardly short of lunacy to content, as many chemists do, that chemical and vital forces are identical." Again he states, "it will require stubborn facts to convince me that man with all his corporeal and intellectual attributes, is nothing but a hydrophosphorated oxyde of azote." One of his most interesting allusions to his disbelief is contained in the following quotation: "I have never opposed microscopical or transcendental philosophy, in the true sense of the term. It is chemical philosophy I have opposed, that mongrel nondescript branch of science—no, not of science, but of blunders and balderdash—which identifies man in function with a German stove, or a Belgian beer-barrel."

Charles Caldwell was withal a man of wide interests and keen powers of observation. At an unexpected juncture is found a reference to the tremendous latent possibilities of Niagara Falls as a source of water power. An address before Miami University in 1832 presented the plea for a national university. Although a Southerner by birth, Caldwell prayed that the Union be held "as steadfast as nature and as lasting as time!" His essays on physical education and prison discipline enjoyed a wide circulation on both sides of the Atlantic. As to the city of Washington, he remarks that "the streets are too wide, and the buildings too low, to furnish any protection against the solar rays" with the result "that the summer temperature of its atmosphere will be but little below that of the inhospitable desert of Zaara." As early as 1801, he advised cold baths as an invigorating measure to counteract "that relaxation and lassitude so universally experienced during the intensity of our summer heats." He then appealed for a regulation of diet, dress, and drink to meet changes in external temperature. Caldwell strikes a singularly modern note when he deplores the dependence of American women on European oracles of fashion: "This unfortunate preference of fashion to reason . . . to com-

mon sense, in dress, cannot fail to prove occasionally destructive to delicate constitutions."

Of his intimate family life but little can be learned. He married twice, having divorced his first wife. A son by his first marriage attended Harvard, and Caldwell deferred his removal from Philadelphia to Kentucky until the completion of his course at that institution.

The old gladiator was afflicted with erysipelas in May, 1853. The local condition cleared up, but he never rallied completely; and although remaining mentally alert, he succumbed on June 9, 1853, in Louisville. He lies buried in Cave Hill Cemetery, Louisville, near the scenes of his last conquest and defeat.

Charles Caldwell was by nature's gift and personal attainment a marked man of his day. Yet grim Fate, ably seconded by the machinations of his own morbid spirit of controversy, has construed to almost submerge him in the oblivion of time. Had he practiced his own preaching that "every man when in health, may, if he please, bridle his tongue," Fortune would have dealt more kindly with him. In his writings the gem of truth and the germ of discovery are so buried in the chaff of verbosity and the maelstrom of combat as to be largely lost to posterity. Of such it has been written, "For they have sown the wind and they shall reap the whirlwind." Early denied his fond ambition to succeed Rush in the chair of medicine at Pennsylvania, Caldwell's outlook on life was embittered and his attitude toward his associates seemed to invite antagonism rather than friendship. Active in the foundation of two medical schools beyond the Alleghenies, the unfortunate decision of the Board of Managers at Louisville snatched his hard-earned laurels in the evening of his career. Fighting to the end, the battle-scarred veteran recalls Henley's words,

Under the bludgeonings of chance  
My head is bloody but unbowed.<sup>5</sup>

<sup>5</sup> To Prof. William Snow Miller grateful acknowledgement is made for his continuous stimulating

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interest and material assistance in the preparation of this biographical sketch. For the photographic reproduction of the painting of Caldwell in his earlier years, taken from the portrait in the College of Physicians, Philadelphia, the author is indebted to Dr. Francis R. Packard and Mr. Charles Perry Fisher.

# Developments in Medical Education in Brazil

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Brazil, with a population of 65,637,000 and an area of 8,516,050 kilometers, has 27 medical schools. There are wide differences in the economic and cultural development in different areas, so that any discussion on the subject must be on a very general basis and represents only the major trends. Several exceptions, therefore, occur to our general observations, and consequently no individual cases will be cited.

The present status of medical education in Brazil is the following: Of the 27 existing schools, thirteen are subsidized by the Federal government, two by State governments, and twelve are private. The private schools receive grants from local authorities and private funds. The number of students varies from a maximum of 1,905 to a minimum of 36 per school. There are at present 10,298 medical students. An idea of the rapid quantitative development of our medical schools may be given by the fact that, from 1933 to 1950, there were thirteen schools in Brazil, and since then fourteen have been founded, to make an actual total of 27.

Only two schools have all their basic science personnel doing full-time work. In several other schools part of the personnel have gradually begun to put in full time, and at present, about eight schools have work full time in basic sciences and five in clinical sciences in some but not all departments. The budgets of the existing schools, save for rare exceptions, are surprisingly low and incompatible with scientific work.

One may understand our present situation in medical education if the following factors are considered:

Concerning our historical background it

suffices to say that the first schools of University level began after Emperor D. João VI of Portugal fled from Napoleon to Brazil in 1808.

Until then printing was forbidden by law; schools of university level did not exist, and their organization was deliberately discouraged. Autochthonous medical research did not begin with intensity in Brazil until around 1900, in subjects related to public health, headed mainly by Lutz, Vital Brasil, and Cruz. The first university with a group of effectively working schools was founded in 1920. For historical reasons both students and teachers have a definite tendency toward theorization. Two factors explain this tendency: first, the Portuguese culture having remained during colonial times in a Middle Age status (4); and, second, the tendency, induced by slavery, of considering manual labor unworthy (3).

Social factors also considerably influenced medical education: first, the temperament of the students who, almost all by tradition, study the subjects only a fortnight before examination. The marked individualism of Latins does not lead to cooperative work so necessary to Medical Education (anarchic individualism) (1).

Another factor is of an economic nature; Brazil, despite rich natural resources, was and is a poor country, governed until recent times by an oligarchy relatively uninterested in cultural problems. Funds for research and education were and still are limited. A summarized discussion of these factors is presented, because the author feels that any improvements in our medical education should consider them as the main sources of the present status.

Considering these preliminaries a rather low level in medical education should be ex-

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pected. However, the interference of other factors had a decisively healthy influence on the development of our Medical schools.

Between 1920 and 1930 the Rockefeller Foundation, collaborating with the government of the State of São Paulo, built and organized a Medical School, with high standards, full-time work in the basic sciences, and a limit of 80 students. It is difficult to evaluate the influence of such a school as an example in the environment, but it was very marked. Probably the greatest benefit the Rockefeller Foundation has contributed to medical education in Brazil has been the liberal provision of fellowships to train personnel in accredited centers abroad. In 40 years approximately 180 fellowships have been given, and it is easy to understand how this renovation has influenced our schools. The lack of adequate working conditions for these fellows to continue their activities in Brazil has, however, in several cases severely hindered this program. At present a Federal Government Agency called C.A.P.E.S. (Companhia Nacional de Aperfeiçoamento de Pessoal de Nível Superior) is successfully stimulating the training of personnel in the more developed centers of Brazil, fostering the so-called "Training Centers" which receive fellows for 1-2 years of postgraduate work.

One might consider as a very important turning point in the development of medical education a meeting organized and sponsored by the Brazilian Medical Association held in 1956 in Ribeirão Preto (2). At this meeting were present practically all persons interested in medical education in Brazil; several policies were discussed, and almost unanimous agreement was obtained on fundamental subjects such as the convenience of work on a full-time basis, internship, and the introduction of statistics, medical psychology, and genetics in the curriculum. Unfortunately, one of the conclusions arrived at this meeting was to abolish oral and practical examinations and to select students for the Medical Schools only by written tests. Such a concept was adopted by the Ministry of Education, which forbade

practical examinations. It represents a naive outlook to the problem and is in the writer's opinion the worst that has happened to our Medical Education in the last years. It only aggravates the students' tendency to theorize and eliminates all possibility of improving premedical education that is, in Brazil, adapted to what the University admission examinations require.

Another significant factor in the development of the medical schools has been the subsidization and control of the majority of the schools by the Federal Government since 1950. Until then almost all schools were private and operated under extremely difficult financial conditions.<sup>1</sup>

Since then a very rapid development has occurred, and the level of teaching of most schools has progressed considerably.

A bright note is the facility which exists in realizing minor changes in the curriculum, since no tradition or rigidity exists. Major changes, however, are difficult to introduce, owing to regulations of the Ministry of Education whose centralizing tendencies hinder local initiative.

The popularity of full-time teaching is increasing; several schools have gradually begun extending it to selected subjects, and it is hoped that it will eventually be adopted extensively. Here again the influence of the Rockefeller Foundation has been marked, stimulating these activities, supplementing salaries, and furnishing equipment. Another bright note is that the internship has been adopted as the 6th year of the curriculum in several medical schools and will very probably extend itself to several other schools.

At the moment concepts in medical education are developing rapidly among us, and perspectives would be bright if our leaders had a more exact notion of the vital importance of basic research in the training of M.D.'s.

That this is not so is indicated by the disproportionate amount of money spent in facilities for basic versus clinical sciences.

<sup>1</sup> Owing to our Portuguese tradition, in Brazil private funds are not given to Universities but go almost entirely to private charity hospitals.

Without exact data I would venture to say that at least 5-10 times more money is spent in the clinical subjects.

Several medical schools have built hospitals without having adequate laboratories for their basic sciences—not understanding that good professionals cannot be so formed. Another very unpleasant situation is the fact that almost all medical schools have built larger hospitals than advisable and have consequently experienced difficulties in administration. Their activities are therefore dedicated mainly to public health, a heavy routine hindering research, and teaching.

A definite trend in some schools to select as full-professors persons who have long been doing routine work in a department instead of vigorous research men is also an undesirable sign.

One of the greatest defects of our teaching is a result of our Latin individualism. Very little collaboration exists among the several departments, and interdepartmental meetings and seminars are practically nonexistent. There is consequently an almost complete divorce between clinical subjects and basic sciences, with severe consequences to the efficiency of teaching. As a result, I know of more than one example of a subject's being taught over again two or three times in different departments of a same school. Integration of courses is nonexistent, although the writer has been trying for years to begin an experiment on this subject.

Federal Government regulations and red tape are so complicated in Brazil that it was

and still is exceedingly difficult to receive equipment or chemicals donated by foreign agencies to the different Universities. A situation is so created that the beneficiary hinders the acceptance of help!

The already mentioned lack of continuity in the student's work severely hinders the teachers' efforts, and I am sure students would profit much more if a rigorous final exam covering all subjects were made at the end of the medical course. I am convinced that this would be the cheapest and easiest isolated procedure with more direct and beneficial far-reaching consequence in medical education in this country and probably Latin America.

In the author's opinion other changes should be introduced in our medical education, such as extension of full-time to all faculty of the so-called basic sciences and, if possible, to a large number of clinical sciences; encouragement of research in the medical schools with adequate funds and facilities; and the encouragement of collaboration and joint work between clinical and basic science departments.

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## Biophysics in a Medical Curriculum

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In 1948, Professor W. A. Selle (5) conducted a survey among the deans and the chairmen of the departments of physiology of each of 68 medical schools concerning the emphasis to be placed on physics in the medical curriculum. The consensus, as indicated by this survey, was that greater emphasis should be given to the teaching of biophysics, though projected methods appeared to differ widely. Since that time a number of concrete events have indicated an accelerated interest in biophysics—both generally and in medical education. A survey of the current bulletins from 60 of the medical colleges in the United States shows that there are now four departments of biophysics and three departments of physiology and biophysics, all of which are presenting courses to the medical students of their respective institutions. The wide interest in the field can be measured, to some extent, by the fact that the membership of the newly formed national Biophysical Society totals over 600.

Several more recent papers have discussed the importance of adequate comprehension of physics during the medical training, especially in physiology. Two of these reports, one by Lagemann (3) and the other by Stewart (6), have stressed the usual lack of adequate motivation toward the learning of physical principles by the premedical student. A third paper, by Bruner (2) has reported the results of an analysis of 2644 techniques and procedures used in 1005 technical papers in the 1954-1955 volumes of eight leading representative medical research journals. In this tabulation descrip-

tive procedures, including such things as case reports, discussions of ideas, and descriptions of structure or behavior accounted for 13.5 per cent of the techniques. A total of 28.4 per cent were classed as biological procedures and included surgical techniques, blood counting, histological techniques and others, while chemical determinations accounted for 32.8 per cent. Physical procedures, encompassing a wide range of techniques such as gas analysis, radioactivity determinations, calorimetry, electrocardiography, and differential centrifugation, accounted for the surprising total of 25.2 per cent of the procedures analyzed. It appears that physical principles receive less attention than their importance in the field of medicine warrants.

The present report describes how material, often referred to as biophysics, has been incorporated into the curriculum of one school. This is not necessarily proposed as a general procedure, but it is an example of one scheme that may fit certain time and personnel arrangements. No doubt there are many approaches to the goal of making the medical student cognizant of physical ideas in his profession.

In the fall of 1955 the University of Missouri Medical School changed from a 2- to a 4-year curriculum, a change which involved revising the preclinical curriculum. After due consideration the curriculum committee of the local medical faculty included a 32-lecture course, entitled "Biophysics," as a requirement during the first semester of the freshman year. The person who was to teach this course was to be administratively attached to the Department of Physiology and Pharmacology. The

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designation of the semester in which the course was to be taught and the designation of a department to teach it determined the scope, level, and many details of the course. The present discussion starts with this commission and shows how it was executed. Admittedly, much more could be written on whether or not there should be a separate course in biophysics, whether the course should be given early and be broad and comprehensive or be given later and be more intensive, and whether it should be administratively part of one department or autonomous.

The course requirements for admission to the local school include eight credit hours in general physics. In each class a few students have had more physics and advanced mathematics, but in general it must be assumed that the students have been exposed to general sophomore level of physics and can solve simple algebraic equations. With these conditions existing it seemed appropriate to put the biophysics course on a broad "grass roots" level, in general making the transition from non-living illustrations of physical concepts toward showing that physics also applies to living material. This would seek familiarity with concepts as opposed to mastering techniques or formulae.

Physical ideas may be illustrated biologically at many levels involving molecules, cells, organs, systems, and populations. The training and experience of the author were in engineering and mammalian physiology, so that examples used in this biophysics course tend to follow this influence. Also, these examples serve to preface the medical physiology course beginning the second semester of the first year. The human physiology type of illustration has its didactic advantages for the biophysics material per se, since the student has a general knowledge of this level of biology.

The course material is divided into three sections with approximately ten lecture periods devoted to each. These sections are: I. Quantitative Concepts; II. Classical Physical Concepts; and III. Modern Physi-

cal Concepts and Techniques. The balance of this paper is concerned with presenting the general nature of the lecture topics which are outlined in detail in Table I. The

TABLE I  
SYNOPSIS OF THE MISSOURI  
BIOPHYSICS COURSE

1. Quantitation
  - A. Fundamental and Derived Quantities
  - B. Dimensional Analysis
  - C. Scalar and Vector Quantities
2. Graphic Calculus
  - A. Differentiation: Instantaneous Rate of Change
  - B. Integration: A Process of Summation
3. Exponential Expressions
  - A. Decibel, pH, and Optical Density
  - B. Radioactive Decay, Bouger-Lambert Law, Biological Half-Life
4. Time Series
  - A. The Sine Wave and Wave Propagation
  - B. Fourier Series and Spectral Analysis
5. Measurements
  - A. The Dilution Principle
  - B. The Fick Principle
  - C. Clearance
6. Instrumentation
  - A. A Generalized Instrument System
  - B. Static and Dynamic Characteristics
  - C. Feedback Systems
7. Statistical Distributions
  - A. Probability and the Normal Distribution
  - B. Significance: The "t" and Chi-Squared Tests
  - C. The Poisson Distribution
  - D. Interrelationships between Sets of Data
8. Mechanics
  - A. Forces: Gravity, Inertia, Elastic, Friction
  - B. Work and Energy
  - C. Oscillatory Motion
  - D. Muscle: Forces and Gross Energetics
9. Kinetic Theory
  - A. Heat and Temperature
  - B. Temperature Control in the Body
  - C. The Gas Laws
  - D. Diffusion, Active Transport and Osmosis
10. Acoustics
  - A. Physical and Psychological Parameters of Sound
  - B. Ultrasound and Its Physical Effects
11. Fluid Statics
  - A. Vapor Pressure
  - B. Surface Energy
  - C. Hydrostatic Pressure
12. Fluid Dynamics
  - A. The Continuity Equation
  - B. Pressure-Flow Relationships
  - C. Energetics
  - D. Turbulence
13. Electricity
  - A. Concepts: Charge, Potential, Field, Lead Systems
  - B. Biological Potential Differences: Diffusion Potential and Active Transport
  - C. Ionic Basis of Excitation and Propagation
  - D. Biological Effects of Electric Current

TABLE 1—Continued

14. The Electromagnetic Field
  - A. Birefringence
  - B. Generation and Absorption
  - C. Geometrical Optics of Vision
  - D. Color
  - E. Microscopy: Phase Microscope, Diffraction, and Resolving Power
15. Atomic and Nuclear Structure
  - A. Nucleus
  - B. Orbital Electrons and Quantal Energy Exchanges
16. X-Rays
  - A. Mechanisms of Production
  - B. Absorption: Photoelectric Effect, Compton Scatter, Pair Production
17. Nuclear Energy
  - A. Fission and Fusion
  - B. The Nuclear Radiations
18. Radioactivity Quantitation
  - A. Activity
  - B. Dosimetry: Roentgen, REP and RAD
  - C. Radiation Detectors
19. Radiation Effects
  - A. Physical and Chemical Changes
  - B. Biological Effects
  - C. Exposure
  - D. Medical Applications

lecture material has been assembled by this author as a text, *Elements of Biophysics* (4).

It is the purpose of the first section to introduce and integrate many of the quantitative concepts which are of importance in medicine but which are not generally included or stressed in undergraduate training. Several of these ideas are simple review presented anew to stress their medical importance and application or to tie together many separate entities. For example, the first topic, quantitation, is largely developed around the thesis that all physical quantities encountered in biology can be expressed in terms of the fundamental physical quantities of mass, length, and time. Abramson's monograph on dimensional analysis (1) provides many illustrations of biological quantities the unity of which becomes evident when it is realized that these quantities can be expressed in terms of the three physical quantities. Similarly, the use of logarithms to the base ten is reviewed, not as a computational aid for carrying a large number of decimal places, but as a means of learning the idea of the "log scale" encountered in pH, DB and optical density calculations.

Several advanced quantitative concepts are introduced in descriptive form with the aim of trying to give the students some familiarity with the topic as it is often encountered in the medical literature. The difference between scalar and vector quantities is discussed, and the students are responsible for constructing a vectorcardiogram loop from two limb electrocardiograms. Many biological and physical kinetic problems can be unified when one appreciates the basic first-order equation in which the rate of change of a process is proportional to the amount of the process unchanged. This is illustrated in terms of radioactive decay, disappearance from the blood stream of injected materials, the first-order chemical reaction, and the Beer-Lambert law.

The ideas of the mathematical derivative and integral are presented as practical means of computation when rates of change are not constant. These are shown by graphic means as, for example, in computing the work done by a muscle which exerts a force which varies as the length of the muscle changes. Similarly, the area of the pressure-volume tracing of the lung during respiration is presented as representing the work being done in moving the air. The slope of the plethysmogram tracing is used as one illustration of the derivative; other illustrations used include the temperature gradient, the effectiveness of a stimulus waveform, and the first-order process definition.

The general topic of time series is used to describe the terminology associated with the sinusoidal wave, wave propagation, Fourier analysis, and frequency spectra.

In the topic of measurements, defined as practical quantitation, the severe limitation which living material places upon the measurement of many quantities is stressed. The need for indirect measurements is well illustrated by a discussion of the Fick principle, the dilution principle, and kidney clearance. Numerical problems illustrating these principles are given to familiarize the student with the methods used to estimate cardiac output, blood volume, etc.

A generalized instrument scheme is discussed in terms of the function and terminology of the transducer, amplifier, and indicator, with no attempt to mention all the common instruments the student is apt to encounter. This same framework is used to describe the general characteristics of feedback systems or control systems, the descriptive biological illustrations of which are numerous, including the regulation of body temperature, blood pressure, respiration, blood hormone levels, and the stretch reflex. Pathological conditions of these regulatory mechanisms have common characteristics, e.g., the appearance of an oscillation of the regulated quantity, as in Traube-Hering vasomotor waves and Cheyne-Stokes breathing.

The local medical curriculum contains no separate biostatistics course but treats the topic as one of quantitative interest within the biophysics material. The time available is such as to limit the discussion to presenting the general ideas of probability, the normal distribution, the Student's "*t*" distribution, the Chi-squared distribution, the Poisson distribution, and tests of significance. The assignments and examinations require drill in problems on statistics as well as on all the other quantitative material covered.

The second third of the course is concerned with giving the student a practical working concept of masses, electric charges, electromagnetism, and the forces and energies associated with them. In the topic of mechanics inertial forces are discussed in terms of the centrifuge, aviation medicine, and the ballistocardiograph. Elastic forces are associated with muscle, the lungs, and the cardiovascular system. Mechanical work is involved with the movement of the elements experiencing a force, resulting in changes in potential and/or kinetic energy content. Free energy can be defined here for the system in which mechanical forces operate, as well as for the system in which the chemical bond is important. The gross mechanics of muscle are presented in the form of the A. V. Hill empirical equation for

the expenditure of chemical energy during muscle contraction.

The mechanics introduced at the macroscopic level is then modified to include the kinetic molecular theory providing a basis for the concepts of heat, temperature, specific heat, and entropy. These are then illustrated in terms of the physical mechanisms associated with temperature regulation in the body. The gas laws are discussed as they apply to respiratory physiology and metabolic measurements, including the kinetics of diffusion and osmosis and a definition of active transport.

The discussion of acoustics is confined to defining the physical parameters of sound and stressing the differences between the physical and the psychological characteristics. Some possible mechanisms of biological effects of high intensity sound and ultrasound are discussed.

Many of the mechanical and kinetic concepts must be oriented slightly differently for fluids at rest and in motion. Vapor pressure, surface tension, and adsorption are discussed as biological examples of static fluids. Static pressure measurement is also covered here. The linear relationship between fluid flow and applied pressure, expressed by Poiseuille's law, is introduced, and the many deviations found in biological situations are discussed, including turbulence, finite particles, and non-rigid tubes. The energetics of flowing fluids can be associated with the work of the heart.

The electrical forces between charged particles are described as the basis of the biological potentials. The nomenclature of the various biological lead systems is introduced. Once diffusion, electric potential, and active transport have been covered, the ionic basis of active depolarization of excitable tissue in general is discussed. This gives a theoretical basis for understanding electrotonus, absolute and relative refractoriness, all-or-none responses, the stimuli strength-duration relationship, adaptation, summation, inhibition, etc., covered in the nerve-muscle section of the physiology course. The waveform nomenclature of

electric stimuli and some of the biological effects of electric current are treated.

The forces and energies associated with electromagnetism are discussed from the standpoint of the generation and absorption of this form of energy in biological situations. The absorption mechanism is, of course, particularly significant in diathermy, spectrophotometry, and colorimetry. Considerable emphasis is placed on the geometrical optics of the eye. The discussion of microscopy is concerned with the limitations of the conventional light microscope and the reduction of certain of these limitations by the phase microscope and the ultraviolet and electron microscopes.

The last third of the course seeks to acquaint the student with the modern physics concepts and terminology which he will encounter in his course and clinical work. This is begun with a discussion of the Bohr concept of the atom and the quantal nature of energy exchanges. The production and absorption of x-rays and of the terminology of physical origin in the field of roentgenology are explained. Nuclear energy is presented as being analogous with chemical energy on the molecular scale. The nuclear radiations are defined, along with their biological range characteristics. The quantitative aspects of radioactivity are analyzed as the concepts associated with activity and dosimetry. The principles of some radiation detectors and the sources of counting errors are covered.

Although the detailed applications of isotopes and radiations are encountered in the more medically oriented courses, one lecture is devoted to the advantages and disadvantages of these techniques and the bases of some of the more common diagno-

tic and therapeutic procedures, as, e.g., the use of  $I^{m1}$ . This is done to reinforce the concepts of the roentgen, the curie, and the electron volt with the idea of giving the student some feeling for the amounts of these quantities and their practical utility. In the concluding lecture the physico-chemical concepts of the biological effects of ionizing radiation are outlined as a preface to the more histological presentation which the student will receive later in pathology and radiology.

It is difficult, if not impossible, to evaluate objectively the success of an experimental teaching program such as this. It is believed that the level of presentation is reasonable for these students who have a minimum background in the physical sciences, since the students who do poorly in biophysics are generally the poorer students in biochemistry and anatomy. The greatest benefit of adequate preparation in a fundamental area, as biophysics, appears in the form of a better grasp of new practical situations which occur after the student has entered practice.

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# A Method for Observing Valve Action in the Excised Beef Heart

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Direct observation of the structure and action of heart valves in a fresh preparation is of considerable value in teaching cardiovascular function. Recent advances in heart surgery, particularly for relief of valvular defects, has made necessary more precise understanding of the spatial and functional relationships of valves and their attachments. However, interest in visualization of internal structures of the heart is by no means recent. In 1886 Gad (2) described his method for demonstrating the valves in the beef heart, combining in a certain degree the older methods which stem from as early as 1671. Tigerstedt, in 1913 (1) described in detail the arrangement used to that time, and illustrated a method upon which our improved technique is based.

The method described here draws attention to an improved sealing device to penetrate the ventricular cavity so that pulsatile pressures applied to the fluid contents of the heart simulate the effect of contraction of the ventricular wall.

## METHOD

A freshly excised heart is dissected free of excess tissue and great vessels and the aorta exposed to its base. The left atrium is opened, and the ventricle lighting and sealing device shown in Chart 1 is made ready to install. The device consists of an inner funnel with a hollow, threaded stem (*A*); and an outer funnel (*B*) which fits onto the stem, held in place by the bar-shaped locking nut (*C*). To install the assembly, the

light and wire (*D*) are removed. The pointed tip piece (*E*) is slipped into the end of the threaded stem of the inner funnel and inserted tip-first through the mitral valve and into the ventricle. The tip is caused to pierce the ventricular wall at the apex. The tip piece is removed from the stem. The outer funnel is placed onto the stem, pressed firmly against the apex of the ventricles, and the locking nut threaded on the stem. The apical portion of the ventricles is now securely clamped between the inner and outer funnels to provide a leakproof seal.

The electric light bulb illuminates the chamber of the left ventricle and the valves of the left heart. The lighting unit is prepared from rubber-covered wires soldered to the base of a small 6-volt bulb, which is then dipped in transparent liquid plastic and air-dried. This is repeated several times to provide a water-tight coating on the bulb and electrical connections. The wires are threaded down the inner funnel so that the bulb lies in the lower portion of the ventricular cavity.

The observation windows to be mounted in the heart are shown in the right-hand inset in the accompanying figure; the aortic valve window, side view (*F*); the mitral valve window, top view (*G*). They are brass cups 3 cm. and 4 cm. inside diameter, respectively; each is 5 cm. long. Side tubes, 1.2 cm. inside diameter, 2.5 cm. long, are located on the cups as shown. Transparent plastic windows close one end of each cup. The smaller cup is located in the aorta close to the semilunar valve and securely tied in

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place by heavy string, pressing the tissue firmly into the annular groove. The larger cup is tied in place in the left atrium over the mitral valve in a similar manner.

After the ventricular sealing assembly, the light and windows are installed, the heart is mounted in ring supports, and the observation windows fixed in their position

directly over the valves by clamps as shown. A reservoir (*H*) with a bottom tap is mounted 30-40 cm. above the left atrium and connected to the inlet tube of the atrial window. Another tube is attached to the outlet connection of the aortic valve window and suspended vertically a distance of about 1 meter. This tube simulates the

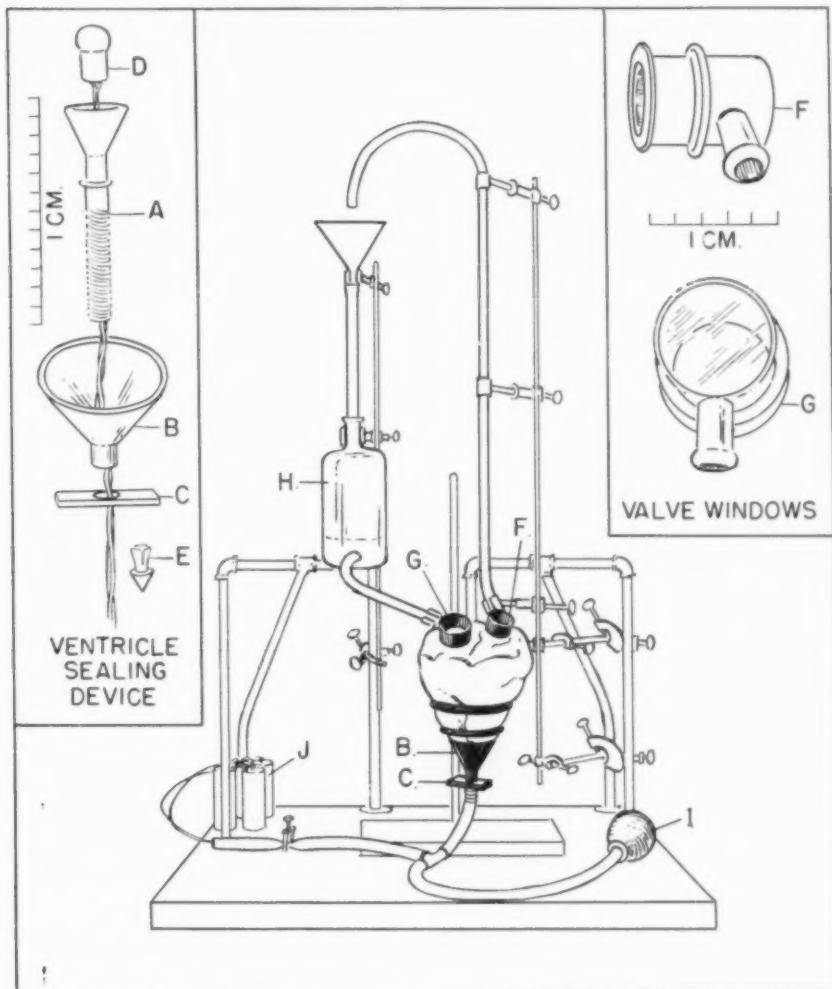


CHART 1

elastic aorta and provides sufficient hydrostatic pressure to assure closure of the aortic valve. The outflow from the "aorta" returns to the funnel in the reservoir. A rubber bulb (*I*) of 250 ml. capacity is attached by a large-bore tube to the stem of the ventricle sealing assembly. The electrical wires are led through this tubing to batteries (*J*) through a side tube sealed with a hose clamp. After assembly the preparation is filled with 0.9 per cent saline so that sufficient fluid remains in the reservoir to assure filling of the heart during diastole.

Rhythmic compression and release of the rubber bulb simulate contraction and relaxation of the ventricular musculature. Fluid is thus pumped around the closed circuit, and the heart valves may be observed in action promoting unidirectional flow. Transillumination of the valves makes possible visualization of their exquisite structure, and, additionally, one may peer through the mitral valve during ventricular diastole and observe the ventricular cham-

ber, the papillary muscles, and cordae tendineae. The action of the valves is easily photographed, with sufficient light provided within the heart. The elastic tubing and hydrostatic column above the aortic valve serve to produce the characteristic wave form of the aortic pressure. The preparation is usually made on the left side of the heart, but the functional mechanics of the right heart may be demonstrated with the same equipment, changing only the location of the windows and reducing the height of the column which simulates the pulmonary artery. Finally, one may experimentally disturb the action of the valves or their attachments to simulate the lesion of disease.

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# A Laboratory Course in Physical Anthropology

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In 1956, the Department of Anatomy of the University of Toronto initiated a laboratory course designed to complement the lecture course in Physical Anthropology given to first-year premedical students by Professor J. Norman Emerson of the Department of Anthropology.

This course consists of weekly 2-hour laboratory periods and is divided into three parts which deal with Human Osteology, Applied Osteology, and investigation. A manual is being developed for guidance of the students.

## ORGANIZATION OF THE COURSE

*Part One.*—In this part of the course, the student studies the morphology of the individual bones of the human skeleton, noting basic principles of form related to function.

During this period he is also able to participate in the excavation and processing of skeletal material from one of the Indian burial sites currently under study by the University.

Seeing a large volume of material, reconstructing skeletons, and identifying fragmentary bones results in a surprisingly good knowledge of human osteology in a short time.

*Part Two.*—During the second part of the course the students work in pairs, studying in succession 24 different displays. These displays consist of specimens, diagrams, and a printed outline summarizing the topic and directing the observations to be made.

This phase of the course is based upon the osteological knowledge gained in the first term. The topics covered include an-

thropometry, determination of stature, age, and sex, anomalies and variations, observations on the dentition, paleopathology, fossil man, and primatology.

Anthropometry is introduced by the taking of certain cranial measurements and the calculation of indices. Emphasis is placed on visualizing head form from the numerical expressions developed. The length of limb bones is measured and used for the calculation of stature.

By means of radiograms, graphs, and specimens of juvenile bones, the principles of bone growth are illustrated and applied to age determination. A series of skulls of known age forms the background for studies of suture closure. A simple outline of the sequence of changes occurring in the face of the symphysis pubis is presented, and bones of various age are examined to illustrate the principle.

Sex differences in the skeleton are pointed out with particular emphasis on the skull and pelvis.

An introduction to paleopathology is given through a series of displays showing bones affected by trauma, tumors, osteomyelitis, and osteoarthritis. Here, preliminary concepts of the body's reaction to disease and its incidence in various ethnic groups are formulated.

Anomalies of the skeleton are seen and considered in relation to our concept of the normal, and their possible genetic origin.

The comparative anatomy of the primates is reviewed with emphasis on the cranial features of higher forms and observations of the so-called simian characteristics. Following this, morphological traits of ethnic groups are surveyed through a study of racial skulls.

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Casts of fossil man are examined from an evolutionary standpoint, and charts are constructed placing each form in its temporal and geographical location.

Emphasis on study of the teeth is noteworthy because this topic is frequently neglected in subsequent studies. Dental observations include form and eruption sequence of primary and permanent teeth, variations in number and morphology, types of occlusion, attrition, caries, and periodontal disease.

*Part Three.*—After completion of the first two parts of the course, the student is assigned a project in the broad field of morphology. Laboratory facilities are made available to him where he may work independently on his own schedule. The completed report of his investigations is evaluated and forms part of his term mark in Anthropology.

Over 300 such projects have now been completed, with results varying from mediocre to excellent. On the whole, however, the reports have been surprisingly good.

Typical of the project titles are the following:

1. A study of the relation of diet to dental conditions.
2. The incidence of arthritis in pre-Columbian Indians.
3. A comparative study of the distal femoral epiphysis.
4. Variations in the form of the transverse palatine suture.
5. The reliability of suture closure as an index of age.
6. A comparative study of the muscles of mastication and skull form.
7. A comparison of the newborn rhesus and human.
8. A study of variations in the form of the orbit within Indian populations.
9. The size and form of the humeral head as an indicator of sex.
10. Incidence and significance of hypercementosis.

The Physical Anthropology section of the Department of Anatomy functions as a

storeroom, museum, workroom for processing excavated bones, and a research laboratory. Material available for study consists of a collection of over 200 adult skeletons from dissecting room subjects of known sex and verified age, ca. 500 Indian skeletons from Ontario sites ranging from prehistoric to recent, a series of juvenile skeletons, and a comparative collection of mammalian skeletons. On display are specimens showing anomalies, variations, and pathology.

#### EVALUATION OF THE COURSE

Observations on the course will be made from four viewpoints: those of the student, the Department of Anthropology, the Department of Anatomy, and the Medical School.

*1. The Student.*—Coming as it does at the beginning of his University career, the opportunity for studying human material is a strong attraction to the student whose current studies are far removed from his later medical courses. The chance to do independent investigation is greeted with enthusiasm by the students, who spend many more hours than might be expected in the completion of their problems.

*2. The Department of Anthropology.*—Dealing at first hand with the anthropological material gives a vitality and meaning to the didactic course, usually producing a more enthusiastic student whose aroused interest leads him to further reading, thought, and discussion.

*3. The Department of Anatomy.*—The preliminary study of osteology is a good preparation for the later courses in anatomy. Also, at this stage it is possible to deal with many facets of anatomy, which, in the busier medical years, are usually omitted altogether or merely mentioned briefly in passing. The course is a chance to present Anatomy at a time when student motivation is at its highest while stress of examinations is at its lowest.

*4. The Medical School.*—From the standpoint of the medical school, the value of the course lies in its providing certain basic con-

cepts early in the student's career: the use of the literature, the scientific method, and the statistical approach. The experience of doing independent work is a valuable preparation for the subsequent clinical subjects.

An interesting sidelight of the course is the opportunity of observing the variation in the individual student's capacity for doing independent investigation. A possible future use for the course may lie in comparison of performance in this investigation setting with success in Medical School, so forming a possible basis for predicting subsequent student performance.

#### SUMMARY

1. A laboratory course in Physical Anthropology given to Premedical students in the Department of Anatomy of the University of Toronto is described. In this course, human bones are excavated, studied, and compared for age, sex, race, individual, and pathological differences and related to primate and fossil man skeletons. Independent student investigations follow.

2. Early learning of basic osteology and the concepts of individual differences and dynamic changes in bones with application of research techniques justify the course which is enthusiastically accepted by students.

# Some Experiments in Teaching with the Clergy in the University of Nebraska College of Medicine

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For the past 3 years a vigorous growth of cooperative programs in medicine and psychiatry has developed at the University of Nebraska Hospital. In the undergraduate period this has centered around the medical student; in the post-graduate area this has led to Institutes for the Clergy, both in the general hospital and in the more specialized area of the Nebraska Psychiatric Institute. These programs have been so fruitful it appeared to be worth while to make them more widely known.

*Efforts with undergraduate medical students.*—In our hospital, which is supported by state tax funds, the chaplains have a quasi-official status but are not appointed to the hospital staff or to the medical school faculty, and do not derive financial support from either. However, there are several areas where the chaplain's duties overlap with those of the medical staff, as both do with the social worker, and it has seemed worth while to explore these with the medical students.

Each month throughout the junior year a group of eight or nine medical students meets around a table for free discussion of "Emotional Problems on a Medical Ward." A member of the department of Internal Medicine, one of the hospital chaplains, and

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a social worker participate. The topics for discussion are suggested in advance, and reading material has been collected on one shelf in the library in preparation for the conference. We have been gratified that some of the students have looked over this reading collection. The first topics suggested were:

- a) Allaying fear
- b) Approach to terminal illness
- c) How much to tell the patient
- d) Role of religion in patient care; faith healing; Christian Science
- e) Role of family in patient care
- f) Autopsy permission

In the hour and a half allotted, all these topics might not be discussed, and the conversation might range further afield. Our goal has been to engender an interest in these ideas without necessarily arriving at any conclusions. A number of other topics have been suggested by Westberg (2): sex education, premarital counseling, functional illness where religious attitudes are involved, and the "broad areas of morals and medicine with special reference to birth control, sterilization, artificial insemination, eugenics, abortion, and euthanasia."

Several of the students have referred to confusing problems they have encountered on the ward. Here arose a problem in that our chaplain had privileged communication from the patient as did our medical team but, without permission from the patient, we were not able to discuss such communica-

tions between us. In actual practice this has proved only a minor problem, since such consent was either freely given or implied. Questions such as should the physician ever refer patients to the Christian Science Reader engendered both pro and con discussion. Our students seemed particularly interested in the special customs of Protestant, Jew, and Catholic which might directly affect preparation for operation, for death, and for burial.

Our experience has been too recent to reveal how many students may show hostility to this approach to emotional stress in the patient. So far we have not encountered any. On the contrary, students often seemed perplexed that physicians in practice do not seek more active collaboration with the minister in grief situations affecting the patient and his family.

*Efforts relating the clergyman to general hospital practice.*—Our hospital chaplain does not have time to meet fully the spiritual needs of the patient and his family during hospitalization as well as his needs upon dismissal. Since patient care must extend beyond the confines of the institution, a working relationship between the local parish pastor and the chaplain has become a necessity. The hospital chaplain, for example, can assist in making the parish pastor welcome in the hospital, and the latter, already established in relation to the patient, has an excellent opportunity to aid in the hospital adjustment. To effect such a co-operative approach, the parish pastor needs to have skill in pastoral care, to know some of the physical and emotional factors relative to the patient's illness, and to be aware of the hospital routine and regulations.

In the two programs offered for pastors at the University of Nebraska College of Medicine in 1958, the general area of "Pastoral Care" and the subject of "Grief" were discussed. In 1959 a conference on "The Unwed Mother" has been held. Attendance at each program was approximately 100, representing all three major religious groups. The programs were so arranged that selected clergymen and medical men had opportunity to speak individually on the subject.

Then a panel made up of physicians, nurses, social workers, and chaplains briefly explored the topics, after which open discussion was allowed. Comments after the programs have indicated that the informal panel discussions were the highlights of the day's sessions. Pastors have requested bibliographies for home study, and some have asked for a more concentrated period of formal study. Plans are being made to conduct a 6-week internship in Clinical Pastoral Education on the campus.

There seems to have been also an effect upon the medical and paramedical personnel. The regular presence of clergymen on the medical college campus in itself raised questions in the minds of medical students. As they learned the purpose for the chaplain's presence and had an opportunity to discuss areas of mutual concern, mutual understanding has developed quickly. Directly out of these discussions have come requests for the chaplain to speak on the subject of Religion and Health, The Role of the Chaplain, and other similar topics to medical students, graduate nurses, and practical nurses.

*Efforts at joint orientation between clergy and psychiatrists.*—The recognition that the psychiatrist is often the last person consulted when a person is disturbed has led to efforts on the part of the staff of the Nebraska Psychiatric Institute, particularly the Community Services Division, to establish a bilateral orientation with various individuals who attempt to work with troubled persons. The most likely persons to encounter disordered behavior in its *incipient* phases are individuals working with groups of population usually considered as functioning within the normal range of human behavior—pastors in their parishes, teachers in their classes, policemen on their beat, employers with their employees.

For the past 3 years the Psychiatric Institute has conducted a program of increasing complexity with clergymen primarily from the Omaha area. The first year's program was entitled "The Clergy and Psychiatry" and was structured to permit an active participation between the clergy-

man and psychiatrist, psychologist, social worker, nurse, and recreational-occupational therapists. Guest speakers in pastoral psychology, general hospital chaplains, domestic relations court chaplains, and a training school chaplain presented their working premises along with those of the psychiatrist and his co-workers. A brochure setting forth these discussions was prepared and published as an orientation text (1) for subsequent beginning groups.

This initial orientation course was telecommunicated to an audience of approximately 150 gathered in each of three state mental hospitals located at Lincoln, Norfolk, and Hastings. Telecommunication permitted a two-way discussion with each of these groups which was led by their hospital chaplain. This program seemed to enhance the efforts of the hospital chaplain to get local clergymen to participate in the mental hospital pastoral care because they were able to dispel many misconceptions about mental hospital procedures.

In the second year, the sessions centered around the demonstration of initial interviewing techniques utilized to elicit problems in a wide variety of clinical conditions in psychiatric patients. The mirrored one-way viewing screen in the classroom auditorium was used so that the audience of 35 ministers could observe and hear what was going on without themselves being seen or heard. Conclusions were drawn afterward, with the visiting clergymen discussing the situation from the pastoral standpoint.

In the third year, the orientation sessions were reduced to 2½ days, while the advanced group met in six sessions, once weekly. The theme of the advanced group centered around one patient—a 15-year-old "juvenile delinquent"—through a 6-week period of evaluation and treatment. Progress in the treatment was directly observed through the mirrored one-way viewing window. Discussion of the therapeutic implications followed each demonstration.

Increased understanding on the part of both ministers and medical personnel in areas of mutual concern for the rehabilita-

tion of disturbed persons has occurred. Several invitations to present an orientation program in various parts of the state have resulted from the activities of previous course participants.

There has been one further and unexpected by-product of the program: since the parish pastors have become aware that the University Hospital recognizes and respects the spiritual needs of the patient, they are preparing their parishioners to approach the hospital stay with greater confidence in the University Hospital. Patients from the parishes of men who have participated in the Institutes have mentioned to the hospital chaplain that "their" pastor had given them greater encouragement because the hospital with its philosophy of patient care was accepted by the pastor.

#### SUMMARY

There has been general recognition on the medical college campus that some of the functions of the physicians and ministers regularly overlap, especially those dealing with emotional problems. Small seminars with third-year medical students have improved understanding between the students and the chaplains and social workers as well as brought to light ignorance and prejudice.

Institutes utilizing medical faculty have had successful programs for the clergy in the medical school setting. Up to this time the subjects of "Pastoral Care," "Grief," and "The Unwed Mother" have been undertaken.

A graduated course of instruction and orientation in psychiatric techniques has been held for the clergy over the past 3 years, culminating in observation of a typical patient and the therapeutic interviews used. Telecommunication has been a valuable aid toward wider geographic coverage.

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# Teaching Medical Psychology through Psychiatric Consultation

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Of the possible kinds of psychiatric activity in a general hospital, consultation on questions of the management of medical and surgical patients is most frequently, perhaps, an immediate exercise in the integration of psychological thought in medical practice. In our experience, such consultation regularly presents special opportunities for the teaching of medical psychology to house physicians and medical students and can be effectively instructive when it is consistently based upon a comprehensive theory of personality. A discussion of some of the considerations that arise in consultative teaching and a delineation of the guiding principles of procedure concurrently evolved, may contribute toward a solution of the problem of usefully blending medicine and psychiatry.

The experiences of consultation that form the basis of this paper are drawn from the program of psychiatric teaching and training developed under Dr. Grete L. Bibring at the Beth Israel Hospital (4-6). The consultation service is one of a number of activities comprised within this program. Senior psychiatrists are regularly affiliated with the other major hospital services of medicine, surgery, obstetrics, and pediatrics. They serve as consultants and as psychiatric instructors to the house staff of their respective affiliated services. Psychiatric Fellows in advanced training act as consultants after they have gained experience in our methods. The assistance of our clinical psychologists and close cooperation with the medical so-

cial work program within the hospital are considered essential in the activity of the consultation service. There is no special ward set aside for psychiatric patients; although this limits the time in which we can treat people with very acute or persistent assaultive, suicidal, or other markedly disturbed behavioral tendencies, it has the advantage, from the teaching standpoint, of never permitting the house physician to relinquish to the psychiatrist all responsibility for the care of his patient within the hospital.

## THE INTEGRATION OF MEDICINE AND PSYCHIATRY

The growing modern integration of medicine and psychiatry has come about for many reasons. Almost all the patients who experience mild, transitory emotional reactions to physical illness, most of those who suffer from psychosomatic disorders, and many others with psychopathological states remain the responsibility of the general physician, internist, surgeon, or other specialist outside of the field of psychiatry. Even when symptoms of emotional disturbance are not apparent, the physician often needs special psychological understanding in order to secure the optimal cooperation of the patient for adequate history taking, physical examinations, or indicated treatment, or to determine the best way in which to discuss his medical findings with the patient. At the same time, the physician must frequently experience the emotional impact of exposure to difficult attitudes in people and extremely stressful and moving life situations. Another, less obtrusive but po-

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tentially valuable reason for developing, increasing, and systematizing the physician's psychological thinking lies in the area of mental hygiene or preventive psychiatry (4). Because people turn confidently to their doctors and reveal themselves in times of physical stress, when their major emotional conflicts are intensified, the physician is frequently in a position to detect incipient psychopathology. His therapeutic activity, including his special relationship to the patient, can favor personality strength and mental health.

In the light of these considerations of the need for an integration of psychological thought into medical practice it is believed that the potential contribution of the psychiatric consultant should go beyond offering a specialist service. In addition to pointing the way to necessary care for mentally ill persons, the consultation service acts as a training resource to the staff of the general hospital. Each consultation becomes the means of exchanging information about diagnosis, interviewing techniques, problems of motivation and cooperation, other psychological aspects of medical management, and the physician's own emotional reactions as these affect the patient. Since questions arise in the care of people who are in the main well adjusted, the consultant must find a structured way to discuss normal personality. The diagnosis of personality type, as distinct from that of psychopathology, has particular importance in preventive psychiatry. Prevention not only requires the discovery of impending illness as early as possible, but also the anticipation of potential sources of mental stress and the strengthening of adaptive forces in the patient. The personality diagnosis includes knowledge of what is likely to constitute stress and of the patient's individual ways of coping with this. It must be mentioned that this discussion of psychiatric consultation focuses upon the medical care of adults, although much of it can apply in the treatment of children; among essential differences are the diagnosing of the stage of psychological development rather than of a more

stabilized kind of personality in children, the emphasis upon working with and through the parents, and the using of special approaches in communicating with children.

#### THEORETICAL FRAMEWORK

The teaching and training program of which the consultation service forms a part was discussed recently with particular attention to the psychological approach utilized (5). The essential psychological framework was defined as that of psychoanalytically oriented psychology. "This psychological system maintains that there is more to a person's emotional processes than appears on the surface and that his behavior patterns and attitudes are the result of conflicts between his deep strivings and his defensive methods against these strivings, developed in a slow adaptive process under the impact of environmental pressures and demands." The personality type is a summary of a person's principal and consistent ways of satisfying or warding off his deep strivings, and coping with the demands of the world around him. It depicts his leading attitudes and habitual behavior patterns, and the important needs, active conflicts, psychological defenses, skills, and values that give rise to his behavior. An awareness of different types including hysterical, compulsive, oral, and other kinds of personalities is very useful in teaching, but to describe them more fully would involve too great a departure from the main theme of this paper.<sup>1</sup>

The physician's responsible activities in conducting an adequate examination, informing the patient (or his family, as necessary) of the findings in the interest of promoting health, and in recommending or carrying out treatment all have a potentially therapeutic emotional impact upon the patient. Beyond this, certain techniques having psychotherapeutic effect have been considered as being available to the physi-

<sup>1</sup> Articles dealing with these and related areas are being prepared for publication by members of the staff of the Psychiatric Service.

cian who is not trained in formal psychotherapy (8). Some of these are directed toward the patient, while other methods aim to effect changes in the patient's environment. From the standpoint of psychological principles, following Edward Bibring's conceptual scheme, the major psychotherapeutic agent utilized by the physician who is not a psychiatrist is *suggestion* (3). Suggestive techniques involve the induction by the physician of ideas, impulses, emotions, and actions of the patient on the model of a child-parent relationship; the patient unconsciously endeavors to gain the love and esteem or to escape the censure of the physician, as if the doctor were as important and powerful as a parent. Although some patients are more amenable to suggestion than are others, it is usually carried out without the physician having conscious knowledge of the patient's personality type. Thus it has a certain hit or miss quality. The physician's explanations to the patient of the meaning of symptoms and of the reasons for tests and treatment have the effect of *clarification*, a second psychotherapeutic principle. They enable the patient to view his illness with more detachment and to rely less upon fantasies, which are often very frightening. When the physician has made a personality diagnosis he will be able to employ selectively a third kind of psychotherapeutic procedure, that of adaptive intervention or *therapeutic manipulation*. In therapeutic manipulation "through our words or attitudes we may neutralize certain emotional systems in the patient, mobilize others, and utilize them for . . . curative aims; one can redirect existent emotional attitudes from neurotic toward adjustive goals, or one can intensify latent emotional systems favorable to readjustment which represent the patient's readjustive reserve; or one can, perhaps, establish 'new' attitudes." Adaptive intervention is especially useful in the area of medical management and will be illustrated in a clinical example of a consultation to follow. When correctly employed it means that the physician can help the patient to utilize the

strength of his personality in cooperatively combatting illness, and that the doctor and his patient do not work at cross purposes.

#### THE TEACHING CONSULTATION

In the course of a psychiatric consultation special opportunities arise for the teaching of medical psychology. Careful consideration may be given to the ways in which the referring doctor formulates his request for consultation and introduces the psychiatrist to the patient, and to the method whereby the consultant organizes his impressions and recommendations. In every case the consultant will evaluate the existing doctor-patient relationship, take into account the effect of certain features of medical practice in a general hospital and pay particular attention to communication with the referring physician.

To the consultant the kind of question that is asked by the house doctor is an immediate indication of the doctor's relationship to the patient, his psychological training and perceptiveness, and his awareness of his own attitude toward the patient. By assisting the physician to formulate his questions the psychiatrist avoids a mutual misunderstanding of the nature and value of the consultation, and may stimulate the physician to a broader comprehension of the case. Usually the physician has been impressed by gross evidence of mental disturbance in the patient's current behavior or past history, has recognized an existing or impending problem in the management of a physically or psychosomatically ill person, or has a question of differential diagnosis. Problems in medical management have many forms: the refusal of recommended surgery; a threat to sign out of the hospital against advice; reluctance to leave the hospital, or a return of symptoms when discharge is discussed; the question of how to present a recommendation for surgery to an anxious patient; the question of what to discuss with the patient who has a neoplasm; the question of the effect of steroid drugs on a particular patient; the management of a colostomy; etc. Although they confront the

physician more frequently than do frank psychiatric disorders, he may be less likely to ask for consultation on questions of management until he has learned what psychiatry may have to offer.

Sometimes the problem that occasions a request for consultation is resolved in the initial discussion between the consultant and the referring physician. More often the psychiatrist will proceed to interview the patient. The decision whether to introduce the consultant as a psychiatrist to the patient, whether beforehand, during the initial interview, or exceptionally (with certain apprehensive but unquestioning patients) after longer contact, and whether volunteered or in response to the patient's inquiry, is approached with the aim of not upsetting the patient or provoking his resistance. When it is feasible to have the house physician present during the psychiatric interview the consultant may be able to demonstrate ways of relieving some of the patient's anxiety and, at the same time, may teach interviewing technique. The consultant's appraisal will take into account the nature and course of the patient's illness, his familial, vocational, and other social relationships including those within the hospital, the clinical goals and problems of the referring physician, and the resources and limitations of the hospital. Although the patient's leading defensive reactions may be quickly recognized, it is usually necessary to correlate a variety of impressions of the patient's current behavior, childhood experience, ways of coping with crises, and so forth, in order to arrive at the personality diagnosis. For purposes of clear and concise formulation the consultant teacher may find it helpful to consider how the physical and psychological factors are related and what situational elements are inherent in the particular kind of physical illness or change: the patient may be coping adequately with his illness; he may have a physical illness with psychological repercussions; the course of the illness may be affected to an unusual degree by emotional factors as in psychosomatic disorders and some cases of advanced physical dis-

ease. Especially important situational elements may be those of acute illness, as such, hospitalization, special demands made upon the patient in the course of diagnosis or treatment (e.g., diabetic diet), chronic illness, rehabilitation, surgery, terminal illness, repeated minor illnesses, or a critical developmental period (e.g., menopause). In addition to questions of treatment and disposition of frank psychoses, behavior disorders and neuroses, the consultant is often concerned with distinguishing organic disease from states of anxiety and depression, conversion hysteria, hypochondriasis or malingerer.

The psychiatrist may make recommendations to be utilized in continued management of the case by the referring doctor, or he may advise both medical and psychiatric treatment, or psychiatric care alone. The referring physician may find psychological terminology strange. He may be disappointed, at times, that the psychiatrist leaves him with a choice of possible measures and treatment goals rather than definitive recommendations. If he is sophisticated in psychological theory he may feel that the consultant tells him little more than what he already knows about his patient. Accordingly, the consultant will avoid psychiatric jargon, explain why he gives tentative recommendations, help the physician to make use of his psychological acumen, and specifically arrange necessary conferences for discussion and follow-up of the case. The observations and activities of nurses, dieticians and others who have close contact with the patient will be included and specified in the treatment plan. Thus, consultative teaching may reach many members of the medical team.

The effect upon the patient of the doctor-patient relationship is a central consideration in approaching every ward consultation. As far as possible the patient's conscious expectations of care are ascertained as well as his more childlike unconscious reactions to the doctor as a parental figure. The consultant's attention is, of course, focused upon the personality structure and

situational problems of the patient; inevitably he must, to some extent, also take into account the personality and situation of the physician who has the greatest responsibility and activity in the care of the patient. When a relationship of mutual confidence and respect has been established, the house physician will more readily mention his own responses to patients and the consultation may become a means for him to increase his self awareness, so valuable in work with upset and upsetting patients.

In the teaching hospital the doctor-patient relationship is influenced by the sharing of responsibility among the physicians of each service in a hierachial organization and also among various medical specialists. The advantages of these arrangements in facilitating expert care of patients and the training of younger physicians are well known; some of the inherent problems often play an important part in management difficulties. The intern or resident may feel deprived of the responsibility and status that can facilitate his interest in the patient. At the same time his satisfaction as a helper of other human beings can be reduced. It is easier for him to withdraw from difficult patients in a general hospital than it will be later as a practitioner. Because of the division of responsibility and the rotation of house officers in a teaching hospital, there is the danger that patients lose the emotional support that they would receive if they had regular care by one physician. Often the patient may be unsure as to who is in charge of his case. He may feel, realistically or not, that he is uninformed or has been given differing medical explanations or recommendations. Certain patients utilize the authority structure in the hospital in a neurotic fashion for the unconscious reenactment of conflict experiences from childhood; for example, playing one person against another and disbelieving all of them. Hospital administrators and others who are aware of these difficulties are actively working to minimize the fragmentation and discontinuity of patient care (7). The psychiatric consultant will attempt to discover whom the

patient regards as his doctor and to learn from the referring physician who it is that sees the patient most consistently. The consultant then tries to help achieve continuity of care for the patient. When it is not possible for one physician to make major decisions, it may yet be feasible to arrange a consistent plan of communication with the patient.

#### AN ILLUSTRATION

Many of the clinical, theoretical, and procedural considerations that we believe to be important in teaching are illustrated in the case of a 60-year-old, single man referred by the surgical service. He is representative of the large group of relatively well adjusted people who react to the stress of a physical illness with anxiety and intensification of behavioral traits.

The patient was referred for psychiatric evaluation because he repeatedly postponed surgical treatment. He had had an operation for biliary obstruction due to cholelithiasis almost 7 months before, on a private surgical service. The complication of acute pancreatitis necessitated drainage of an abdominal abscess. Because of his financial situation in the face of his long illness, the patient was transferred to the ward service. Subsequently, a third operation for revision of the sinus was performed. Although it appeared that a fourth procedure to assist drainage would shorten his hospital stay, he had become anxious and talked of signing out of the hospital. The patient had discussed this important decision with his sister who lived in another city. Greatly concerned about him, she had contacted his former private attending surgeon and also a second senior member of the Surgical Service on several occasions. The psychiatric consultant noted that the interest of these two leading surgeons in the patient created in members of the surgical house staff a special determination to treat the patient very successfully; the difficulties which they encountered thus added to their feelings of frustration and led to definite tension between them and their patient.

When interviewed the patient was friendly and polite in manner, very neat in appearance, and showed great consideration of others on the ward. He knew that he was upset and thought that the psychiatrist might help him to feel better. As the patient spoke of the grave fears about the proposed operation and then described his life and work, the picture emerged of a steady, reliable, responsible, planful, conscientious person who approached decisions gradually and strongly identified himself with the management at his job. The patient's positive appreciation of his former private surgeon contrasted with a feeling that the younger ward physicians were inconsiderate and "walked away" from him at rounds.

In succeeding discussions with the surgical house staff, the psychiatric consultant explained his impression (based upon the foregoing observations) that the patient was a compulsive type of personality. The patient felt disappointed and anxious because of the stress of his prolonged illness, and he characteristically reacted to pressure with indecisiveness and obstinacy. His transfer to the ward service had deprived him of the direct care of his private surgeon and he had found it difficult to establish a close relationship with the ward "management" in his accustomed manner. The consultant believed that it was important to approach the patient in such a way as to permit him to use his careful, planful method of proceeding in order to deal with his anxieties adequately and to minimize the chance of his developing a paranoid attitude. Thus it was decided that the patient should not be pushed, but rather be allowed further time in which to make up his mind about the operation; his questions were to be answered carefully, in thorough detail, repeatedly as necessary, and as unhurriedly as possible; the doctor would try to establish clearly that the patient understood the surgical recommendations and took an appropriate amount of responsibility in accepting or rejecting them. The patient was to be told that his present anxiety at the prospect of a relatively minor surgical procedure could be understood in

light of the strain and discomfort of the long illness (which he had actually borne in a good spirit.) It was to be suggested that if he felt that anyone tried to avoid answering his questions he did not have to accept this as final; perhaps it would be possible for him in such circumstances to make an appointment with the doctor to see him at a convenient time after the rounds were completed. Finally, the doctor planned to explain his recommendations similarly to the patient's sister. The psychiatrist was to be available for further consultation and planned at least one additional talk with the patient.

Following discussion along these lines between the surgical house officers, the patient and his sister, the patient decided to permit the operation. Afterwards, he expressed appreciation of the talks with the psychiatrist and the surgeons because they had shown him how he could be strong. The house officers regained their positive regard for him even though he continued to be mildly critical of the attitudes of the younger doctors. On their own initiative, the physicians made a special point of enlisting the patient's active help in the finer details of caring for his dressings; this confirmed that they had gained a deeper understanding of him. The patient's subsequent course was one of rapid healing.

In this clinical example one may see how the personality diagnosis has directed an adaptive intervention, with the result that the patient was enabled to use his characteristic modes of adjustment in a constructive, cooperative way. Management of the case remained the responsibility of the house physicians, and the consultant served as an advisor and teacher. Comparable consultative approaches with some differences in emphasis have recently been described in the out-patient department of a teaching hospital (1) and in general practice (2).

#### SUMMARY

A delineation of the guiding principles of procedure evolved in teaching medical psychology through psychiatric consultation is

offered as a contribution to the useful integration of psychological thought in medical practice. Special opportunities for teaching may arise when discussing the initial formulation of the request for consultation, in introducing the psychiatrist to the patient, and in the presentation of the consultant's formulation. A case is presented to illustrate how personality diagnosis based upon psychoanalytic psychology may permit the house physician to employ psychotherapeutic measures in a specific, purposeful way.

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8. LEVINE, M. *Psychotherapy in Medical Practice*. New York: Macmillan Co., 1949.

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*70th Annual Meeting*  
of the  
*Association of*  
*American Medical Colleges*

**EDGEWATER BEACH HOTEL**  
**CHICAGO • ILLINOIS**

**NOVEMBER 2, 3, 4 • 1959**

## *Information*

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### **Hotel**

It is important that requests for hotel reservations be made directly to the Edgewater Beach Hotel in Chicago and not through agencies or hotels in other cities.

Your cooperation is requested in sharing a double room with another member if possible and in notifying the hotel to this effect. When accommodations at the Edgewater Beach have been exhausted, the Reservation Clerk will seek space for you at the Sands Motel or nearby hotels.

Tickets for the Annual Dinner, Monday Evening, November 2, will be \$7.50 and should be purchased at the time of registration.

### **Registration**

The Registration Desk will be open as follows:

Saturday	October 31	9:00 A.M.- 3:00 P.M.
Sunday	November 1	9:00 A.M.- 7:00 P.M.
Monday	November 2	8:00 A.M.- 7:00 P.M.
Tuesday	November 3	8:00 A.M.- 5:00 P.M.
Wednesday	November 4	9:00 A.M.-12:00 noon

### **Women's Activities**

Information regarding the formal program that has been planned will be available at the Registration Desk.

### **Pre-Conference Meetings**

#### **CLOSED MEETINGS**

*Friday, October 30 and Saturday, October 31.* Meeting of the Medical School-Teaching Hospital Section of the Association. (Section members and Deans only.)

*Sunday, November 1.* The morning has been reserved for meetings of the several standing committees of the Association.

*Sunday, November 1—11:30 a.m.* Executive Session of the Continuing Group on Student Affairs (limited to designated representatives of the medical schools).

*Sunday, November 1—2:00 p.m.* A meeting of the members of the Executive Council, university presidents, medical vice-presidents, and medical school deans.

#### **OPEN MEETINGS**

*Saturday, October 31 and Sunday, November 1.* The 3rd Annual Meeting of the Continuing Group on Student Affairs.

*Sunday, November 1—3:30 p.m.* Meeting of government representatives and educators on Medical Education for National Defense.

### **Annual Reports of Standing Committees**

Mimeographed copies of the annual reports of the standing committees of the Association will be provided at the time of registration. Open hearings on each of these reports will be held Tuesday, November 3, at 4:00 P.M.

## **ASSOCIATION OF AMERICAN MEDICAL COLLEGES**

### **70th Annual Meeting Program**

The theme of all of the plenary sessions will be  
MEDICAL EDUCATION IN A CHANGING WORLD

#### *Monday, November 2*

- 9:00 A.M. INTRODUCTION OF NEW DEANS AND FOREIGN VISITORS, ANNOUNCEMENTS
- 9:30 A.M. PRESIDENTIAL ADDRESS—"Medical Schools Are the Keystone of Medical Progress"—John McK. Mitchell, M.D., Dean, University of Pennsylvania School of Medicine
- 10:00 A.M. "Medical Education and the Public Health Service"—Leroy Burney, M.D., M.P.H., Surgeon General, United States Public Health Service, Department of Health, Education, and Welfare
- 10:30 A.M. "Medicine and the New Biology"—Theodore Puck, Ph.D., Professor and Head of the Department of Biophysics, University of Colorado School of Medicine
- 11:00 A.M. "The Resurvey of Pre-Professional Education: Trends and Outlook in the Liberal Arts College"—Aura Severinghaus, Ph.D., Associate Dean, Columbia University College of Physicians and Surgeons
- 11:30 A.M. "Is Medicine Getting Its Share of Recruits from the High School?"—Earl H. Hanson, Superintendent of Public Schools, Rock Island, Illinois
- 12:00 NOON LUNCH
- 2:00 P.M. THE 1959 TEACHING INSTITUTE: THE SECOND INSTITUTE ON CLINICAL TEACHING  
George P. Berry, M.D., Dean, Harvard Medical School, *Chairman*, Sub-committee on Teaching Institutes  
Charles G. Child, III, M.D., University of Michigan Medical School, *Chairman*, 1959 Institute  
"Medical School Curricula: An Operation on Clinical Teaching"—Oliver Cope, M.D., Harvard Medical School  
"The Roles of the University and Specialty Boards in the Education of Medical Students, Interns and Residents"—Isidor S. Ravdin, M.D., University of Pennsylvania School of Medicine  
"Science and Art in Teaching Responsibility for Patients"—Milton Rosenbaum, M.D., Albert Einstein College of Medicine of Yeshiva University
- 3:00 P.M. "The Teaching Hospital: Its Responsibilities and Its Conflicts"—Albert W. Snone, M.D., Director, Grace-New Haven Community Hospital
- 3:30 P.M. "Education for a Learned Profession"—J. Douglas Brown, Ph.D., Dean of Faculties, Princeton University

7:00 P.M. ANNUAL DINNER OF THE ASSOCIATION

- a) Presentation of the Borden Award in the Medical Sciences for 1959—Thomas B. Turner, M.D., Dean, Johns Hopkins University School of Medicine
- b) Presentation of the Abraham Flexner Award for Outstanding Service to Medical Education—William Bean, M.D., Chairman of the Committee on the Flexner Award
- c) Second Alan Gregg Memorial Lecture—"Medicine: The New Science and the Old Art"—Warren Weaver, Ph.D., Vice-President, The Alfred P. Sloan Foundation

*Tuesday, November 3*

(Continuing the theme "Medical Education in a Changing World")

9:30 A.M. "Medical Education during the Next Decade from the Point of View of a Pharmaceutical Manufacturer"—Mr. Eugene N. Beesley, LL.B., President, Eli Lilly and Company, and Chairman, Health Information Foundation

10:00 A.M. SIMULTANEOUS SESSIONS IN THE BALLROOM AND MICHIGAN ROOM

THE BALLROOM:

10:10 A.M. "Medical Students: An Untapped Potential for Basic Science?"—L. M. N. Bach, Ph.D., Tulane University

10:30 A.M. "Research and Elective Time in the Medical School Curriculum"—Robert G. Page, M.D., University of Chicago

10:50 A.M. "A Retrospective Evaluation of Research in the Medical Curriculum"—Arthur Ebbert, Jr., M.D., Yale University

11:10 A.M. "The Medical Schools in Nuclear Medicine"—Marshall Brucer, M.D., Oak Ridge Institute

11:30 A.M. "Radioisotopes in the Physiology Laboratory"—John C. Rose, M.D., Georgetown University

THE MICHIGAN ROOM:

10:10 A.M. "Pre-Medical Years: Problems and Proposals"—Rodger L. Buck, M.D., Harvard University

10:30 A.M. "A Study of the Interests and Attitudes of Freshman Medical Students with Respect to Patients"—Guy Hollifield, M.D., University of Virginia

## **Tuesday, November 3 (continued)**

- 10:50 A.M. "A Psychodynamic Study of Medical Students and Their Adaptational Problems"—Harold Lief, M.D., Tulane University
- 11:10 A.M. "Patterns of Influence: Medical School Faculty Members and the Specialty Interests of Medical Students"—Robert E. Coker, Jr., M.D., University of North Carolina
- 11:30 A.M. "An Investigation of the Predictability of the Choice of Medical Specialty and Its Correlation with Personality Organization"—George H. Pollock, M.D., University of Illinois
- 12:00 NOON LUNCH
- 1:30 P.M. "The Next Ten Years and the Association of American Medical Colleges"—Ward Darley, M.D., Executive Director, Association of American Medical Colleges
- 2:00 P.M. SIMULTANEOUS SESSIONS IN THE BALLROOM AND MICHIGAN ROOM

### **THE BALLROOM:**

- 2:10 P.M. "The Honor System in U.S. and Canadian Medical Schools"—Ralph D. Tanz, Ph.D., Western Reserve University
- 2:30 P.M. "The Teaching of Anatomy Beyond the Freshman Year in the Medical Curriculum"—Zygmunt Menshik, M.D., Georgetown University
- 2:50 P.M. "A Teaching Program Based on Comprehensive Care for the Family"—Robert W. Quinn, M.D., Vanderbilt University
- 3:10 P.M. "Psychiatry—Inherited or Acquired Knowledge?"—Edward A. Tyler, M.D., Indiana University
- 3:30 P.M. "The Placebo Effect in Medical Education"—Paul J. Sanazaro, M.D., University of California of San Francisco

### **THE MICHIGAN ROOM:**

- 2:10 P.M. "The New Outlook in Medical Education in Colombia"—Ernest Carroll Faust, Ph.D., Tulane University / Universidad del Valle
- 2:30 P.M. "The Jacksonville Experiment in Post-Graduate Education"—Max Michael, Jr., M.D., University of Florida

- 2:50 P.M. "Medical School Stores"—Alexander M. Greene, Chairman, Medical Publishers' Group
- 3:10 P.M. "The Soundproofed Room: An Aid in Teaching Cardiac Auscultation"—Dale Groom, M.D., Medical College of South Carolina
- 4:00 P.M. OPEN HEARING<sup>6</sup> ON ANNUAL REPORTS OF COMMITTEES  
*a) Audio-Visual Education  
b) Continuation Education  
c) Financing Medical Education  
d) Editorial Board  
e) International Relations in Medical Education  
f) Internships, Residencies and Graduate Medical Education  
g) Licensure Problems  
h) Medical Care Plans  
i) Medical Education for National Defense  
j) Medical School-Affiliated Hospital Relationships  
k) Public Relations  
l) Research and Education  
m) Veterans Administration—Medical School Relationships*

## *Wednesday, November 4*

- 9:00 A.M. BUSINESS MEETING  
Roll Call  
Voting on new members  
Report of Chairman of Executive Council—John McK. Mitchell  
Report of Executive Director—Ward Darley  
Report of Secretary—Richard Young  
Report of Treasurer—Murray Kinsman  
Report of Editor of *Journal of Medical Education*—John Bowers  
Report of Director of Operational Research—Leland Powers  
Report of Director of Research—Helen Gee  
Report of Director of Public Relations—Tom Coleman  
Annual Report of Committees  
New Business—Resolutions  
Installation of Officers

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ADJOURNMENT

# *AAMC Second Institute on Clinical Teaching*

CHICAGO, ILLINOIS

OCTOBER 27 TO 31, 1959

## *Tuesday, October 27*

8:00 P.M.

### ORIENTATION SESSION

Discussion-group chairmen, recorders, and secretaries will convene for procedural briefing

8:30 P.M.

### INFORMAL RECEPTION, *South Terrace*

## *Wednesday, October 28*

9:00 A.M.-12:30 P.M. GENERAL SESSION

Introduction to the 1959 Institute—Dr. George P. Berry, Chairman of the Subcommittee on Teaching Institutes of the Committee on Research and Education; Dean and Professor of Bacteriology, Harvard Medical School

Dr. Charles G. Child III, Chairman of the 1959 Institute; Professor of Surgery and Chairman of the Department, University of Michigan Medical School

### *Medical School Curricula: An Operation on Clinical Teaching*

Introduction—Dr. J. Englebert Dunphy, Chairman of Subcommittee I; Professor of Surgery and Chairman of the Department, University of Oregon Medical School

“False Idols in Medical Education”—Dr. Carroll B. Larson, Professor of Orthopedic Surgery and Chairman of the Department, State University of Iowa College of Medicine

“Tribulations of a Specialist”—Dr. Joseph F. Artusio, Jr.; Professor of Anesthesiology in Surgery, Cornell University Medical College

“The Paradoxical Plight of the Basic Sciences”—Dr. Howard C. Taylor, Jr., Professor of Obstetrics and Gynecology and Chairman of the Department, Columbia University College of Physicians and Surgeons

“The Teaching Potential of a ‘Non-teaching’ Hospital”—Dr. George C. Ham, Professor of Psychiatry and Chairman of the Department, University of North Carolina School of Medicine

ADJOURNMENT to designated rooms for Discussion Groups

12:30-2:00 P.M.

### LUNCHEON

2:00-5:00 P.M.

### GENERAL SESSION

“The Operation”—Dr. J. Englebert Dunphy

"Postoperative Reactions of a Basic Scientist"—Dr. Philip Handler, Professor of Biochemistry and Chairman of the Department, Duke University School of Medicine

"Postoperative Reactions of an Internist"—Dr. Richard V. Ebert, Professor of Medicine and Head of the Department, University of Arkansas School of Medicine

ADJOURNMENT to designated rooms for Discussion Groups

## *Thursday, October 29*

9:00 A.M.-12:00 M. GENERAL SESSION

*The Roles of the University and Examining Boards in the Education of Medical Students, Interns and Residents*

"The University's Role in House-Officer Education"—Dr. Eugene A. Stead, Jr., Chairman of Subcommittee II; Professor of Medicine and Chairman of the Department, Duke University School of Medicine

"Postgraduate Schools and House-Officer Education"—Dr. John G. Darley, Executive Secretary, American Psychological Association, and Professor of Psychology (on leave of absence), University of Minnesota (formerly, Associate Dean of the Graduate School, University of Minnesota)

ADJOURNMENT to designated rooms for Discussion Groups

12:00 M.-2:00 P.M. LUNCHEON

2:00-4:30 P.M. GENERAL SESSION

Introduction—Dr. Eugene A. Stead, Jr.

"Examining Boards and Medical-Student and House-Officer Education"—

Dr. John H. Gibbon, Jr., Samuel D. Gross Professor of Surgery and Head of the Department, Jefferson Medical College of Philadelphia

Dr. Leo G. Rigler, Visiting Professor of Radiology, University of California at Los Angeles School of Medicine

Dr. John P. Hubbard, Executive Secretary, National Board of Medical Examiners, and Professor of Public Health and Preventive Medicine, University of Pennsylvania School of Medicine

ADJOURNMENT to designated rooms for Discussion Groups

6:00-8:00 P.M. DINNER

8:30 P.M. SYMPOSIUM ON PROFESSIONAL EDUCATION

Introduction—Dr. George P. Berry

"Doctors, Scientists, Engineers"—Dr. Lee A. DuBridge, President, California Institute of Technology

"The Cultivation and Control of Professionalism"—Dr. Jacques Barzun, Dean of Faculties, Provost, and Professor of History, Columbia University

## *Friday, October 30*

9:00 A.M.-12:15 P.M. GENERAL SESSION

### *Science and Art in Teaching Responsibility for Patients*

"The Physician-Patient Relationship"—Dr. Herbert S. Gaskill, Chairman of Subcommittee III; Professor of Psychiatry and Head of the Department, University of Colorado School of Medicine

"Knowledge, Conviction, Ignorance"—Dr. John D. Benjamin, Professor of Psychiatry, University of Colorado School of Medicine

ADJOURNMENT to designated rooms for Discussion Groups

12:15-2:00 P.M.

LUNCHEON

2:00-5:00 P.M.

GENERAL SESSION

Introduction—Dr. Herbert S. Gaskill

"The Teaching Function of the Physician-Patient Relationship"—

*Moderator:* Dr. Albert J. Solnit, Assistant Professor of Pediatrics and Psychiatry, Yale University School of Medicine

*Panel:* Dr. Henry L. Barnett, Professor of Pediatrics and Chairman of the Department, Albert Einstein College of Medicine of Yeshiva University

Dr. Leighton E. Cluff, Associate Professor of Medicine, Johns Hopkins University School of Medicine

Dr. William S. Jordan, Jr., Professor of Preventive Medicine and Chairman of the Department, and Professor of Medicine, University of Virginia School of Medicine

Dr. Jonathan E. Rhoads, Professor of Surgery, University of Pennsylvania School of Medicine

Dr. Somers H. Sturgis, Clinical Professor of Gynecology, Harvard Medical School

ADJOURNMENT to designated rooms for Discussion Groups

## *Saturday, October 31*

9:00 A.M.-12:00 M. GENERAL SESSION

SUMMARY

Dr. Charles G. Child III, Chairman of the 1959 Institute

Dr. J. Englebert Dunphy, Chairman of Subcommittee I

Dr. Eugene A. Stead, Jr., Chairman of Subcommittee II

Dr. Herbert S. Gaskill, Chairman of Subcommittee III

DISCUSSION FROM THE FLOOR

## ABSTRACTS

### 70th Annual Meeting of the Association of American Medical Colleges Chicago, Illinois, November 2-4, 1959

MEDICAL STUDENTS—AN UNTAPPED POTENTIAL FOR BASIC SCIENCE? L. M. N. BACH. (Dept. of Physiology, Tulane University School of Medicine, New Orleans, La.)

While considerable care is taken to select highly talented students for admission to medical schools, corresponding efforts are not ordinarily made during their exposure to basic science courses to attract attention to the rewards of an academic career. Our attempts to recruit neurophysiologists are cited as examples of effective exposition to the gratifications enjoyed by teachers and investigators. We utilize student seminars, student participation in the design and execution of laboratory experiments, and participation by selected students in lecturing and laboratory teaching. Maintenance of a high level of enthusiasm for the subject is reinforced by use of current research techniques in the first-year laboratory teaching so that students experience excursions beyond the safe frontiers of certain knowledge. We provide opportunities for independent development of research problems in conjunction with an M.S. program for medical students. Interest in neurophysiology is sustained and developed by the use of advanced courses, journal clubs, and informal home gatherings. Opportunities are provided for presentation at national meetings and publication in scientific journals of student research. Factors operating against selection of an academic career include parental opposition, peer pressures,

apparent lack of status of basic science teachers, curricular and fund limitations. Suggested future activities include (1) securing further curricular recognition that basic science teaching and research are aspects of medicine as important as its practice and (2) provision for better public relations concerning basic science careers directed at premedical students, parents and medical alumni.

THE MEDICAL SCHOOLS IN NUCLEAR MEDICINE. MARSHALL BRUCER, M.D. (Oak Ridge Inst., Oak Ridge, Tenn.)

In 1905 the medical profession went through a period of professional radiation hysteria that was well founded and laid the real background for radiation safety. This wave of radiation hysteria reached its peak in about 1905 and then waned (professionally), partly from contempt and partly from knowledge. Lagging behind this professional hysteria there was a period of public radiation hysteria. This reached its peak in about 1909 and then waned, partly from contempt and partly from knowledge. The current radiation hysteria is almost identical to the wave that occurred in 1905. We have reached our current professional peak in 1958. Professionally, the wave is on the wane; however, the public hysteria probably will not reach its peak until about 1960 or 1961.

Buried within the hysteria there is a real problem in nuclear medicine. The basic

problems in the science and application of nuclear medicine revolve around five instruments that are now necessary in every medical school. The first is the total-body irradiation facility; the second is the whole-body counter; the third is irradiation spectrometry instrumentation; the fourth is a blood-washing facility similar to the artificial kidney; and the fifth is the medical nuclear reactor. All of these are expensive instruments, but they are available to medical schools.

**PREMEDICAL YEARS: PROBLEMS AND PROPOSALS.** RODGER L. BUCK, M.D. (Dept. of Social Relations, Harvard University, Cambridge, Mass.)

The author is currently engaged in a study to assess the current and projected status of the behavioral sciences in the medical curriculum. During this research the whole matter of premedical education has been accorded increasing consideration. The rapid evolution of new philosophies of medical education (particularly those concerned with what is often referred to as the "holistic" approach to medicine), together with the mushrooming accumulation of medical knowledge that must be taught make necessary today, more than ever before, a maximum utilization of the premedical years. If there is disagreement with this statement, it probably centers only around the conception of the word "utilization." From this, certain questions are immediately raised:

1. Is the major function of the premedical years that of delaying the student's entry into medical school until he has acquired a bit more maturity?
2. Are these 3 or 4 years only trying to provide the education that the student should have gained in secondary school?
3. Should the major goal of the premedical years be the acquisition of factual knowledge or, instead, the learning of the habits and methods of scholarship?
4. Should emphasis be placed on the basic biophysical sciences or on a liberal arts background?

5. Should there be premedical requirements in the social sciences?

6. How may the premedical curriculum be designed so that it will provide a better basis upon which to appraise a candidate's qualifications for medical school?

Data and insights regarding these problems will be drawn from the extensive interviews conducted with medical faculty members and medical-social scientists representing all sections of the country, as well as from a review of the literature.

The paper will conclude with an attempt at formulating certain guide-line requisites of an optimal premedical education.

**PATTERNS OF INFLUENCE: MEDICAL SCHOOL FACULTY MEMBERS AND THE SPECIALTY INTERESTS OF MEDICAL STUDENTS.** ROBERT E. COKER, JR., NORMAN MILLER, KURT W. BACK, and THOMAS G. DONNELLY. (Public Health Administration and Dept. of Biostatistics.)

This paper attempts to isolate the more important aspects of the relationship between medical school faculty members and medical students as it affects student specialty interest and choice. The attitudes and perceptions of faculty members with respect to various specialties are examined first. Next to be considered are their own conceptions of their roles in guiding students in their career choices. Finally, student evaluations of faculty members with respect to their competence, teaching ability, and their presumed attitudes toward various medical specialties are introduced. Differences in these respects among various medical schools are described.

The paper is based on material gathered in a survey of the attitudes and opinions of student and faculty in a national sample of eight medical schools. Data were obtained by questionnaires from 2676 students (91 per cent of all students) and 660 full-time faculty members (86 per cent) of all full-time faculty members in these schools. The survey was conducted as part of a study

of factors motivating physicians in their choice of particular specialties or careers in medicine.

**A RETROSPECTIVE EVALUATION OF RESEARCH IN THE MEDICAL CURRICULUM.** ARTHUR EBBERT, JR., M.D. (Dept. of Medicine, Yale University School of Medicine, New Haven, Conn.)

This study was initiated to provide data relative to (1) possible correlations between student research and the subsequent medical career and (2) the medical graduate's retrospective opinion of research as a requirement in the medical curriculum.

At Yale University School of Medicine, preparation of a dissertation based on research is a requirement for graduation. Except for the years 1943-47, the present program has been in effect with only minor modifications since 1925. Information for this study was obtained by a questionnaire mailed to each living graduate for a 25-year period from 1928 through 1952. Replies were received from over 80 per cent.

In analyzing these replies, attention was focused on the department in which the research was done, the year it was begun, and the graduate's type of professional activity, academic appointments, and research carried out subsequent to graduation. The correlations will be discussed.

Of particular interest are the opinions of graduates (1928-42; 1948-52) regarding the influence of the thesis project on selection of their ultimate medical careers; 37 per cent of the total, and 66 per cent of graduates, now in full-time academic medicine, indicated some influence in this regard; 84 per cent of the graduates thought that the preparation of a thesis had helped them subsequently in evaluating medical literature, and 98 per cent of the group were in favor of research, required or elective, as a part of the medical curriculum; 61 per cent recommended that a thesis based on research be required of all students.

**THE NEW OUTLOOK IN MEDICAL EDUCATION IN COLOMBIA.** ERNEST

CARROLL FAUST. (Tulane-Colombia Program in Medical Education, Facultad de Medicina, Universidad del Valle, Cali, Colombia, S.A.)

Before World War II medical education in South America was patterned principally on that of the French schools, in which many of the Colombian physicians had been trained. During the war professional contact with Europe was practically nil and thereafter was not appreciably renewed. Meanwhile, younger physicians in increasing numbers were being trained in the United States in the newer concepts of medical education.

The new outlook was particularly evident in Colombia. In 1953, on invitation, Drs. M. E. Lapham of Tulane, Charles M. Goss of Louisiana State, and Robert C. Berson, then of Vanderbilt, visited the seven medical schools in Colombia and recommended practical changes in their programs. In 1955 Tulane University was requested to provide assistance under a University-Point IV agreement. In April, 1956, the writer became the Resident Coordinator of the Program, and since that time consultants from Tulane have visited the seven schools to study administrative and curricular needs. As a result of the Tulane Program, coupled with substantial assistance from the Rockefeller and Kellogg Foundations, the following steps have been taken: (1) formation of the Association of Colombian Medical Schools; (2) recommendation (March, 1959) that 2 years of intensive instruction in basic sciences be a prerequisite for medical school entrance; (3) more careful selection of medical students; (4) greater emphasis on laboratory and clinic practice; (5) establishment of a department of preventive medicine and integration of epidemiology with clinical medicine; and (6) better coordination of clinical training with the teaching hospitals.

The medical school at Cali (only 8 years old) has led in this development. As the most progressive one in Colombia, it is rapidly becoming the focal center for study and training of medical professors in other Latin American countries, since it em-

bodies the best of North American concepts adapted to Latin American conditions.

#### THE SOUNDPROOFED ROOM—AN AID IN TEACHING CARDIAC AUSCULTATION. DALE GROOM, M.D. (Dept. of Medicine, Medical College of South Carolina, Charleston, S.C.)

Although tape recordings and other aids are helpful to students in learning heart sounds and murmurs, there is no substitute for actual auscultatory examination of patients. The detection and recognition of murmurs of early valvular heart disease, their timing in the cardiac cycle, and interpretation constitute the primary goal of cardiac auscultation. That the auscultatory proficiency of even experienced examiners is seriously impaired by the levels of background noise commonly encountered on hospital wards and in clinic examining rooms has been demonstrated by the following study.

An ordinary clinic examining room was treated with simple soundproofing measures at a cost of less than \$500.00. Its ambient noise level was thereby reduced to 35 decibels as compared with the average 60-70 decibel levels of institutional environments. The auscultatory performance of 40 physician subjects was then measured under conditions simulating those of the stethoscopic examination. Average results for the group indicated that a heart murmur which could be heard in the quiet room had to be increased to more than 12 times the intensity to be audible under the average noise conditions to which we become acclimated and oblivious.

Such a room is a unique, inexpensive, and practicable aid to the student both by eliminating distracting sounds and by actual enhancement of stethoscopic audibility of cardiovascular sounds.

#### A STUDY OF THE INTERESTS AND ATTITUDES OF FRESHMAN MEDICAL STUDENTS WITH RESPECT TO PATIENTS. GUY HOLLIFIELD, M.D.

C. T. ROUSELL, A. J. BACHRACK, Ph.D., and E. G. PATTISHALL, Ph.D. (Depts. of Internal Medicine and Preventive Medicine, Neurology and Psychiatry, School of Medicine, University of Virginia, Charlottesville, Va.)

We have studied the interests and attitudes of a class of freshman medical students with respect to patients by having them conduct information gathering interviews with new clinic patients. A limited amount of nonmedical information was requested. The students had ample time and were encouraged to indulge their curiosities.

These interviews (210) were tape-recorded, and each student completed a questionnaire, which asked for information and opinions derived from the interview. Afterwards the students discussed their feelings about the experience in small seminars.

The recorded interviews, questionnaires, and seminar discussions were analyzed to learn what questions the student asked, what answers satisfied him, and what opinions he formed of these people.

The vast majority of student effort in this nonmedical interview was directed toward getting descriptions of the patient's symptoms and medical experiences. In spite of this tremendous interest in symptoms no student inquired about obvious physical signs of disease. The occupation of the patient was of little interest to the students; vague job titles satisfied them. Interest in the socio-economic and educational accomplishments was small, and many students were reluctant to ask about these things. All students expressed interest in working with the patients they interviewed, and the most frequently given reason was that the patient would be cooperative. Many students attempted to give medical opinion when questioned by the patient, and all were willing to express opinions as to whether the patients' problems were due to physical, emotional, economic, or other factors. These opinions have been compared with those of senior medical students, who did complete medical surveys on the same pa-

tients. The major findings of this study will be presented with some discussion of their implications.

A PSYCHODYNAMIC STUDY OF MEDICAL STUDENTS AND THEIR ADAPTATIONAL PROBLEMS: A PRELIMINARY REPORT. HAROLD I. LIEF. (Dept. of Psychiatry, Tulane University, School of Medicine, New Orleans, La.)

The aim of this investigation has been to determine those personality factors which enhance and those which impede the growth and development of medical students toward scientific maturity, and to study the interplay between different personalities and the medical school environment, and the processes by which a student becomes a doctor.

We have two primary populations, one patient and the other a nonpatient. At this writing the patient group consists of 114 students, the nonpatient of 60 students. Material on the patient population is derived from psychiatric interviews and psychological testing. Results are recorded and analyzed on rating scales, McBee key sort cards, and case summaries. Data on the nonpatient students are derived from a series of psychiatric interviews (seven to ten each year) and psychological testing. Analysis and recording are done in the same way as in the patient group. Selection of the nonpatient group is random, except for stratification on the basis of class standing.

There is a third population consisting of the upper ten and the lower ten students of each of three classes, a total of 60 (some of these will be also in the second group described above). These students are studied by psychiatric interviews (one or two each year) and psychological testing. This group is being studied for correlations of personality factors and degree of academic success.

Results on the six students who formed the population for the pilot project and who were graduated in June will be presented. These will be matched with six patient students for the purposes of comparison of

intelligence, psychological factors, academic success, school and life performance.

TEACHING OF ANATOMY BEYOND THE FRESHMAN YEAR IN MEDICAL CURRICULUM. ZYGMUNT MENSCHIK, M.D., D.Sc. (Georgetown University School of Medicine, Washington, D.C.)

An established tradition is: to teach anatomy to medical students during the first year of their curriculum, to cover at this time the entire material and to have no, or very limited, contact with the Department of Anatomy beyond the freshman year.

It is a fact that anatomy is a prerequisite for understanding physiology and pathology and forms a framework for interpretation of pathogenesis and evaluation of therapy.

A freshman, however, cannot visualize and project with full understanding why and to what extent he needs anatomy for his future medical practice. This is done usually for him by explanatory remarks and clinical examples by the anatomy teacher, but still the freshman himself is unable to think in professional terms.

Many students, after they attended the clinical lectures and fulfilled a large part of their clerkship wish they had, at the senior year, anatomy lectures and, especially, dissections. They would see the subject in its real prospective, understand its reason, and would benefit from it advantageously and effectively in their future professional efficacy.

The suggestion is made to teach anatomy in two installments: first, at the freshman year, the essentials, and, second, at the senior year, applied aspects of the discipline.

Correlated panel conferences, during sophomore and junior years, bringing in front of the students the anatomist, pathologist, and clinician together, proved very successful in a number of schools, including Georgetown University; but no mandatory course of anatomy, including dissections, has been tried to an extent permitting adequate evaluation.

THE JACKSONVILLE EXPERIMENT  
IN POSTGRADUATE EDUCATION.  
MAX MICHAEL, JR., M.D. (Jacksonville  
Hospitals Educational Program, Inc., and  
Dept. of Medicine, University of Fla.)

Various techniques have been tried to provide worth-while residency training in the small community hospital. Based on the premise that such hospitals find it difficult, if not impossible, to accomplish the ideal teaching aims alone, the Jacksonville Program was undertaken.

Six local hospitals have incorporated themselves under the name of Jacksonville Hospitals Educational Program and function through a board comprising administration, governing board, and medical staff representation from each hospital. The Executive Director is charged with catalyzing the various functions associated with medical teaching and with devising and demonstrating methods for improving medical education.

The basic principle of pooling resources—physical, professional, and financial has been utilized. The following have been undertaken and are in various stages of development.

1. Coordination of residency training whereby residents will serve in the hospital, or hospitals, that will best be able to further their educational experience without exploitation.
2. Consolidation of library facilities.
3. Construction of a central research and development laboratory.
4. Development of a television linkage between member hospitals and in turn with the University of Florida, College of Medicine, in Gainesville.
5. A consolidation of conferences, basic science seminars, and teaching assignments in an effort to more efficiently utilize the time of the visiting staff in their teaching endeavors.

Elective clerkships for fourth-year students of the University of Florida have enhanced the teaching program by providing the stimulus of the young inquisitive mind.

The mechanisms, aims and accomplishments to date of this experimental program will be discussed.

RESEARCH AND ELECTIVE TIME IN  
THE MEDICAL SCHOOL CURRICULUM. ROBERT G. PAGE, M.D. (Dept.  
of Medicine, School of Medicine, University of Chicago, Chicago, Ill.)

A revision of the curriculum at the Medical School of the University of Chicago has resulted in the senior students' being in residence for two semesters of 23-24 weeks each. One semester is devoted to 18 weeks of elective time and 6 weeks of Obstetrics and Gynecology. There is also a small amount of elective time available in the other semester, the bulk of which is concerned with out-patient assignments in medicine, surgery, and psychiatry. Elective time has been and still is present in the first and second years.

In the 18 weeks of elective time in the senior year certain course credits are necessary. The choice of subject matter is wide, ranging from full-time research to clinical work and special courses and seminars. At the end of the first year of this program, we decided to find out how the students had indeed spent their time. A questionnaire was sent to each student asking this and other questions. The results of this will be discussed.

All 69 senior students answered the questionnaire. During the 18-week period of elective time, 55 took elective courses, 45 did clinical work, 28 started or continued research, twenty did a variety of miscellaneous activities, three did not answer the question. During the elective time which was available in the out-patient semester (for which no course credit was required), 47 students took elective courses, four worked in clinics, fifteen continued their research, 39 studied, fifteen admitted that they "goofed off," fifteen did "other" things, and eight did not answer the question.

Although research is not required of our students, 55 have at one time or another

been associated to a greater or lesser extent in research activities. Many started in their first year in medical school during the elective time which was available. Many worked in the summers; 36 of these 55 felt that the elective time was the important element in the curriculum which made these activities possible; 20-25 per cent of the students have published articles in national scientific journals.

The number of students doing research during their medical school years is a reflection of the faculty interest in fostering this type of activity. We feel that the voluntary participation of students in research programs does more good than required theses.

**AN INVESTIGATION OF THE PREDICTABILITY OF THE CHOICE OF MEDICAL SPECIALTY AND ITS CORRELATION WITH PERSONALITY ORGANIZATION.** GEORGE H. POLLACK, M.D., Ph.D., and ROBERT I. YUFRIT, Ph.D. (Univ. of Illinois, College of Medicine, Dept. of Psychiatry, Chicago, Ill.)

By the time an applicant has been selected for matriculation to medical school, he has been carefully evaluated and screened. The majority of entering medical students are not firmly committed to a particular specialty of medicine or even to a definite goal other than securing a medical degree. Most of the student population are still in their late adolescence, grappling with the developmental tasks attendant to that phase of maturation. However, by the time of graduation these are either completed or well on the way to being worked out. Thus, too little attention has been paid to the unique and distinct qualities necessary for practicing various medical specialties. Some authors have attempted philosophical discussions of this problem, but few large-scale controlled studies have been conducted to investigate it further.

For a successful practicing physician, the capacity for empathy and introspection, as well as the ability to simultaneously remain

objective, is essential. This facilitates not only diagnostic acumen, but also the carrying out of necessary therapeutic regimes. In an attempt to more systematically investigate the presence of these traits along with the capacity for intimate object relationships as related to later work in medicine, the authors have instituted the following research.

The hypothesis that is being tested is based on the premise that the choice of medical specialty and activity (practice, teaching, research, or administration) is closely connected with the personality organization of the individual student.

While conducting a conjoint course on human growth and development for 190 freshman medical students at the University of Illinois, a methodology involving predictive and later validating studies was evolved and started. This methodology initially consisted of the utilization of an activities index, autobiography, and projective tests (obtained in the first 2 weeks of medical school), as well as the later use of a specific situational test. This situation was the simultaneous observation of the student interviewing individual patients of varying ages and diseases, by a team of evaluators (psychologist, psychiatrist, pediatrician, anthropologist). These judges independently rated the students on a standardized set of items. This allowed for reliability testing. In addition, the student wrote a report on his contact with the patient. This report dealt mainly with his perceptions of the interpersonal aspects of the double interaction of the patient with him. Again a specific form was followed in order to secure data that could be compared with that of other students, as well as with the ratings of the judges. On the basis of these initial data, statements of the degree of intimacy or isolation are made. From these, predictions of medical specialty will be noted. After graduation and internship, the predictions will be checked against the actual choice made, and so the degree of validity will be able to be ascertained. Various other

data will be obtained throughout the course of the medical school curriculum for possible additional correlational studies. A parallel research was conducted on freshman dental students for comparative data.

The purpose of this initial communication will be to describe the various instruments devised and employed in our research, as well as certain preliminary results observed from the data thus far.

**A TEACHING PROGRAM BASED ON COMPREHENSIVE CARE FOR THE FAMILY.** ROBERT W. QUINN, M.D. LOUIS D. ZEIDBERG, M.D., and AMOS CHRISTIE, M.D. (Dept. of Preventive Medicine and Public Health and Dept. of Pediatrics, Vanderbilt Univ., Nashville, Tenn.)

Modern civilization recognizes the family as the basic social unit of our culture. We recognize at Vanderbilt that the family is the ideal unit in which to teach Social and Environmental Medicine and Preventive Medicine at the clinical level.

Custom, administrative requirements, and specialization in medical schools and hospitals and in medical practice have combined to ignore the social and biological unity of the family. In the customary routine of hospital or clinic medical practice the family is fragmented into its individual members, who are further compartmentalized into separate organs and systems and segregated according to age and sex. There is danger of medical students' developing a narrow central vision which might give them an incomplete and misleading picture of the medical problems of patients and their families. The emphasis in the teaching and practice of modern clinical medicine is on the diagnosis and treatment of disease, not on its prevention. To remedy some of these defects a family health program has been organized at Vanderbilt University, School of Medicine, as a teaching demonstration for students, beginning in their first year and extending through all four years, of comprehensive medical and socio-economic care for the family.

This paper describes the objectives, the plan of teaching, and the operation of a special clinic, called the Family Clinic, which has been developed as a demonstration of the teaching and practice of preventive medicine and comprehensive medical care for the family. Several case histories which illustrate the types of families and their problems which have been used as teaching material are presented. A critical discussion of the short-comings of this program as well as its good points is included.

**RADIOISOTOPES IN THE PHYSIOLOGY LABORATORY.** JOHN C. ROSE, M.D., ESTELLE R. RAMEY, Ph.D., and LAWRENCE S. LILIENFIELD, M.D., Ph.D. (Dept. of Physiology and Biophysics, Georgetown University Schools of Medicine and Dentistry, Washington, D.C.)

The first teaching institute of A.A.M.C emphasized the shortcomings of laboratories in the basic sciences and the widespread failure to achieve the aims of laboratory instruction that are "held in highest regard." Student exercises that involve the use of radioisotopes yield quantitative data that develop a greater appreciation of the scientific method than has hitherto been possible.

Following 4 hours of physics review and instruction in instrumentation and radiation safety, all handling of radioisotopes is done by the students. Instrument systems for well- and gas-flow counting are available through a grant from A.E.C.

Studies in animals have included: analysis of the blood-brain barrier ( $\text{Rb}^{86}$  and  $\text{I}^{131}$ -antipyrine), and the blood-aqueous barrier ( $\text{I}^{131}$ -albumin); movement of cations in muscular contraction ( $\text{Rb}^{86}$ ); blood volume ( $\text{T}^{31}$ -albumin and  $\text{Cr}^{51}$ -tagged erythrocytes); intestinal absorption (sodium fluxes, using  $\text{Na}^{22}$ ); exchangeable sodium and sodium excretion in adrenalectomy ( $\text{Na}^{22}$ ); iodine uptake by thyroid ( $\text{NaI}^{131}$ ); liver glycogen formation with endocrine gland ablation ( $\text{C}^{14}$ -acetate) and renal clearances ( $\text{I}^{131}$ -Diodrast).

Sources of new experiments included the

current physiology literature, previous research projects of department members and one from another school's manual. Several original exercises arose out of discussions of physiologic principles requiring increased emphasis.

Criticism of one's own methods has been continually stressed. Recognizing the impossibility of "covering" each area of physiology, the primary requirement of this group of exercises is the collection of accurate quantitative data permitting ample time for analysis and interpretation of over-all class results.

#### THE PLACEBO EFFECT IN MEDICAL EDUCATION. PAUL J. SANAZARO, M.D. (Dept. of Medicine, Univ. of California Medical Center, San Francisco, Calif.)

The important changes which have occurred in the philosophy and methodology of medical education since the period of the Cnidian school are presented in a brief historical review of concepts defining the desirable type of student, teacher, and curriculum. Against this background a critique is presented of current trends in medical education with the conclusion that logical and scientific thinking have not adequately been applied to the premises for curriculum revision and to the interpretation of results of such changes.

The distinction between the notable advances in scientific knowledge and acknowledged major innovations in methods of instruction on the one hand and the lack of similar advance in understanding the complex factors which determine the qualities of the good physician on the other is highlighted by contrasting the descriptions of these three factors at selected intervals in medical history. It appears that only the vocabulary has changed with respect to the third factor: the problems are more clearly defined, but evidence is lacking that understanding has increased. Proposals to instill scientific thinking habits by exposing students to scientific disciplines are viewed as examples of misplaced emphasis. Similar

attempts to produce a cultured and humanitarian outlook by including a study of the humanities during medical training are shown to illustrate the fallacy of "*post hoc ergo propter hoc*."

The common denominators in successful curriculum revisions have been heightened faculty interest in students, prestige, and increased contact between able enthusiastic faculty and well chosen students. Unless there is clear appreciation of this placebo effect in education, desired results may erroneously be ascribed to changes in material content or methodology or educational environment. Those responsible for shaping the future of medical education should utilize the scientific tools of analysis that are deemed the important result of such education.

#### THE HONOR SYSTEM IN U.S. AND CANADIAN MEDICAL SCHOOLS. RALPH D. TANZ.\* (Dept. of Pharmacology, Univ. of Tennessee Medical Units, Memphis, Tenn.)

In an attempt to ascertain the feasibility of initiating an honor system at Tennessee, a questionnaire was sent to 82 medical schools in the United States and twelve in Canada. A tabulation of the questionnaires returned from 78 (95 per cent) of the U.S., and 11 (92 per cent) of the Canadian medical schools is presented. In the United States 34 (44 per cent) of the schools have an honor system. Of these 34, it is compulsory in 31 (91 per cent), and voted upon by the Freshman class in three (9 per cent). Ninety per cent of these 34 schools have a student or student-faculty council set-up to administer the honor system. Wherever the system is functioning it is claimed to be highly desirable and successful. In 43 (55 per cent) U.S. schools and eleven Canadian schools, there is no honor system. Moreover, there has never been an honor system in these Canadian schools, although eight schools in the United States have had such a system at one time or another in the past. Many

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of the schools in the United States which do not now have an honor system have indicated that they are now actively studying or considering the possibility of initiating one. A geographical distribution shows that a majority of the schools on the West coast and in the South presently have honor systems.

**PSYCHIATRY—INHERITED OR ACQUIRED KNOWLEDGE?** EDWARD A. TYLER, M.D. (Dept. of Psychiatry, Indiana University, Indianapolis 7, Ind.)

Learning theories explain possession of knowledge through repeated exposure to basic data. On examining premedical requirements and preclinical medical curriculum, one could draw the conclusion that medical educators considered psychiatry inherited (i.e., applied common sense).

Examination of 85 medical school catalogs reveals little attempt to influence the premedical student to prepare himself for understanding human behavior as a prerequisite for medical education.

A study of premedical electives taken by 600 students from one medical school suggests that students seem more aware of this aspect of medicine than do the faculty.

With little or no required college background, the concept that a basic behavior science is not a necessary prerequisite for the understanding of clinical psychiatry is perpetuated by the relatively few hours assigned to it during the first 2 years of medicine. Examination of high, low, and mean time allotted to all basic science courses in 85 schools suggests that the number of hours assigned is not based on any over-all curriculum planning.

All practicing graduates from one medical school (1945-1955) were polled. They feel 20-30 per cent of their patients have psychiatric problems. Approximately three quarters of this group feel that their medical school curriculum offered little about management of these patients.

Even when hours are assigned, disagreement and confusion exist among clinical psychiatrists as to what is the basic science data for clinical psychiatry.

It is concluded that, while psychiatry has improved its clinical instruction, students are ill prepared to understand these courses. Medical educators need to re-examine undergraduate psychiatric curriculum and develop a basic science with a relationship to psychiatry comparable to that which physiology has to internal medicine.

## MEDICAL EDUCATION FORUM

### Editorial

#### RETURN TO THE WINDY CITY

The 70th Annual Meeting of the Association of American Medical Colleges will be held at the Edgewater Beach Hotel, Chicago, Illinois, on November 2-4, 1959. Although some of us may long for the alpine vistas of Colorado Springs or the ski lift at Sun Valley, a return to Chicago is singularly appropriate.

The Windy City served for many years as the location of our headquarters. It is interesting that the Edgewater Beach Hotel is located about halfway between the old in Chicago and the new in Evanston. From 1911 through 1922, the A.A.M.C. held the annual meeting in Chicago to coincide with the Annual Congress on Medical Education and Licensure.

A meeting in Chicago will recall names that have contributed to the development of the A.A.M.C. Rush Medical College was one of the six founding schools. Nathan Smith Davis of Chicago Medical College was vice-president of the original A.A.M.C. and served as president from 1891 through 1894. Fred Zapfe was elected Secretary-Treasurer in 1904 and served until 1948.

One can speculate whether a medical historian should investigate the significance of the year '76—since 1776 saw the establishment of the Federal Union and 1876 the establishment of the A.A.M.C. One brought freedom to the colonies; the other helped to free the medical schools from the proprietary yoke. It is equally interesting that both groups convened in Philadelphia. Of the six medical colleges that signed the call for the first meeting, only one, Louisville, still operates under the name used at that time. Twenty-two medical colleges were represented at the Philadelphia meeting "to consider . . . reform in medical colleges."

While the Federal Union survived the storms of separation, the collation of medical schools weathered comparable problems. After a relatively few years of tranquillity, the "causus belli" in medical education was the graduation requirement of three terms versus two terms. In 1882, a number of schools seceded from the educational union, and the annual session was terminated. Following a proclamation from Baltimore Medical School, representatives convened in Nashville, Tennessee, on May 21, 1890, to consider various problems of medical education. The skein of medical educators was rejoined, and the flimsy fibers have proliferated to stout cables which form the framework of medical education in United States and Canada.

Since change is a sign of progress, we can be proud of subsequent progress. True enough, we have had our incidents. The establishment of the Liaison Committee with the A.M.A. was hotly debated. The acceleration of the educational program during World War II precipitated a division in attitude. Now, the rapidly expanding number of participants in the annual meeting causes concern. If for the Colonies union brought strength, for the A.A.M.C. growing pains have brought progress.

Medical education today is a national property which is the appropriate concern of a majority of our citizens—and on a very personal basis. Some have suggested that there should be a highly personalized meeting of Deans, as well as the broader forum of the A.A.M.C. This would be socially delightful but academically unsound. The annual meeting of the A.A.M.C. should serve as the annual national faculty meeting.

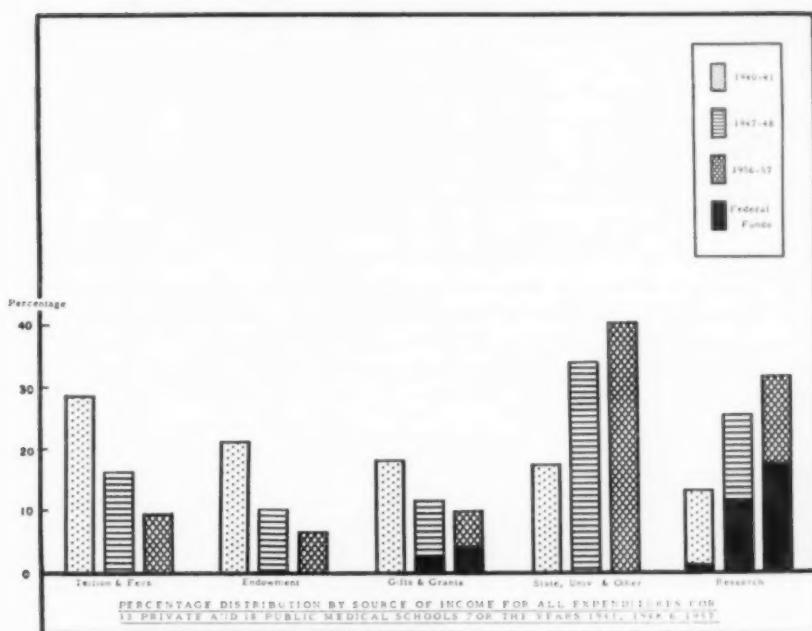
We may all take pride in the fact that now other countries are establishing organizations comparable to the A.A.M.C. In Britain, the Association for the Study of Medical Education is on the way to achievements that we should follow. India, Thailand, and Mexico have established conclaves for medical education. The philanthropic foundations and the Pan American Sanitary Bureau have convened medical educators for fruitful discussions.

Who could have foreseen at Philadelphia in 1876 a meeting such as we will enjoy at Chicago? We have come a long way, but there is still much to do.

JOHN Z. BOWERS, M.D.

## Datagrams\*

### CHANGING PATTERN OF MEDICAL SCHOOL INCOME



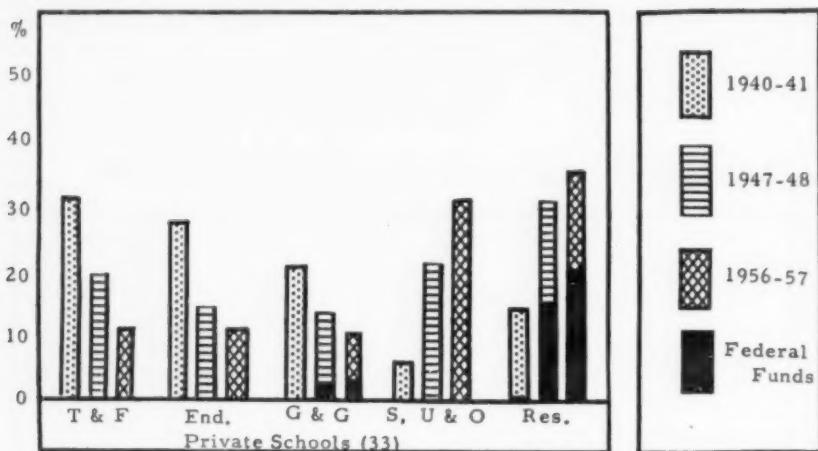
A comparison has been made for the years 1940-41, 1947-48 and 1956-57 of the expenditures, by source of funds, for basic operating expenses and for separately budgeted research of 51 medical schools, of which 33 are privately controlled and 18 are state owned and operated. The percentage distribution of these expenditures is shown above.

There has been a fairly consistent decrease over the years in the proportion of funds derived from each of the following sources: Tuition and fees, gifts and grants, and endowments. The reverse is true for funds derived from state, university and other sources.

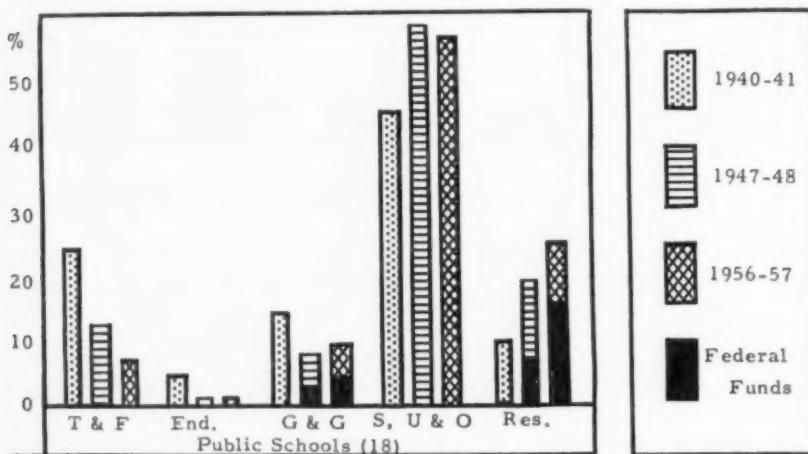
The proportion of expenditures for separately budgeted research increased approximately  $2\frac{1}{2}$  times over the seventeen-year period. As there was little or no shift throughout the period in the proportion of non-governmental grants as a source of funds for separately budgeted research, the over-all increase is attributable to governmental grants.

The over-all pattern in the percentage distribution, by source of income, of expenditures of all 51 schools is similar to that shown on the following page for 33 private schools.

\* Submitted by the Division of Operational Studies of the AAMC. Sources of information will be furnished on request.



The percentage increase in funds derived from state, university and other sources, for public and private schools combined, is influenced primarily by the changing pattern in this category for private schools. The proportion of such funds for public schools was, as would be expected, consistently higher throughout the seventeen-year period but showed less variation.



For the public schools, the proportion of funds derived from endowments decreased from five per cent in 1941 to less than one per cent in 1957. The percentage of non-governmental gifts and grants for basic operations shows a downward trend over the years; the reverse is true during the same period for federal training grants. With respect to gifts and grants, the decrease in the percentage distribution for all 51 schools is influenced in the same direction by both public and private schools.

## Address

### DOCTORS AND THE PRESENT CHALLENGE\*

NEWELL PHILPOTT, M.D.†

The John W. Harris Memorial Lecture serves to extol your previous Professor of Obstetrics and Gynecology.

It was my privilege to have known John Harris for 35 years. And, in the beginning of our training as doctors, we had something in common. Both of us were residents for eminent Obstetricians who were considered to be "medical giants" in those days. These men were Wittredge Williams of Johns Hopkins and Walter Chipman of McGill.

Many of us realize that there was a close bond between Wittredge Williams and "his boy"—John Harris. In fact, it has been stated that John's Medical Bible was the Williams' Textbook of Obstetrics. Furthermore, an eminent gynecologist stated recently, "If ever Wittredge Williams sent out a professor who was 'his man' that person was John Harris. During our visit in Madison we felt extremely at home because here we found, as far as the Department of Obstetrics was concerned, a newer edition of the Hopkins."

So this doctor who was raised in "the seats of the mighty" carried with him qualities of a traditional school into a newer world. It was here that he blossomed forth into complete usefulness.

All who knew him will remember his ease and natural manner, the accuracy of his decisions, and particularly his philosophy that an understanding heart is the most content because it knows the inner satisfaction that only friendliness and friendship can bring.

I have chosen a subject,—"Doctors and the Present Challenge." In preparing this lecture I have borrowed freely the thoughts and phrases of previous teachers and present associates who are considered authorities in their field of endeavor.

My text may be found in Ecclesiastes where it is written: "Wherefore I perceive that there is nothing better than that a man should rejoice in his works . . . for who shall bring him to see what shall be after him?"

This text is purposely chosen because John Harris was the perfect example of one who rejoiced in his works. And this is no wonder, because he contributed greatly in an era when the medical profession was making unbelievable progress. But, with the aging process, there comes a time when a man may no longer rejoice in his works, and the question may be asked,—what shall be after him? If it were possible to obtain the advice of John Harris, I feel certain that he would agree in my presenting a provocative type of lecture—one which concerns the future of our profession.

Three major trends have become evident in the medical world during the last half-century. These are: (a) a trend toward socialization, (b) attempts to change medical education, and (c) the tendency of somatic medicine to become a cut-and-dried science.

*Medicine and free enterprise.*—The great conflict in which we are currently involved both

\* Presented as the John W. Harris Memorial Lecture, Alumni Day, Univ. of Wisconsin, May 15, 1959.

† Department of Obstetrics and Gynecology, McGill University; President, American College of Surgeons.

in politics and in medicine is the totalitarian ideology versus that of the democracy. Basically, the totalitarian system demands fast decisions with promise of immediate success. But experience has proved that the sameness of approach may lead to ultimate failure. In contrast, under free enterprise and democratic principles there is the pluralistic approach evidenced by multiple ideas and methods. The journey may be longer and fraught with many disappointments during the excursion. But this approach is surer to achieve ultimate success.

We need not shrink from our past or be fearful of our future. In review, we should realize that, until recently, we have turned to Europe and to the British Isles for postgraduate education and for example in medical care. Many famous institutions in Germany, France, and England have set the pace in the various specialties of medicine and surgery. Most of us recall the days when it was thought essential for the graduate doctor to travel across the seas in search of the extra polish for his basic medical education. In fact it was considered an incomplete training if a period of one or more years were not spent in some part of Europe or in the British Isles.

Only in the last few years have we, in America, become more dependent upon ourselves for progress in basic medical research and in clinical medicine. It must be realized that we are *comparatively* young in development and that we still have much to learn! Nevertheless, two important facts must be emphasized. First, postgraduate training in medicine and surgery, as demonstrated by the progressive residency training system, has been unique in North America. And second, our hospitals are particularly noted for two important facets of medical care; these are referable to the comfort of the patient and to the furnishing of essential auxilliary services.

Consequently, the postgraduate training system, as found in our country, has given thousands of young doctors a *practical* experience which tends to make the individual highly proficient. On account of the doctor's specialized training, in conjunction with the extraordinary facilities offered by most of our hospitals, it has been possible for medical treatment and surgical techniques to contribute to unbelievable progress.

I shall mention only a few of the advances which are identified with progress in *this* country and which have had a profound influence on disease and injury. The control of tuberculosis by specific chemotherapy is outstanding. While Fleming discovered penicillin, it was the chosen lot of American industry to produce it for human use. The development of the Salk vaccine has greatly reduced the incidence and severity of poliomyelitis. Construction of the heart-lung apparatus for perfusion has at last permitted the correction of many serious abnormalities of the heart. Removal of aneurysms of the major blood vessels by use of human or synthetic grafts has given new hope to those who suffer from vascular defects. Discovery of additional incompatible blood groups and the widespread use of exchange transfusions have saved the lives of thousands of newborn infants. And, finally, the broad attack on malignant disease by improved methods of early diagnosis and of therapy give new hope in this direction.

I challenge anyone to demonstrate comparable progress in those countries which are dictator-controlled.

And for the future, thousands of our research workers are engaged in problems to extend our knowledge of normal function and to determine those alterations which are produced by a variety of diseases. These research workers are engaged in a *free* creative activity whose

product will have vital significance by improving the health of our people. True research should be accomplished under these conditions which permit intellectual freedom.

With reference to medical practice, we find an authoritarian philosophy in Russia and other satellite countries. In contrast, America has essentially a free medical practice. Between these two differing concepts we find the system of a more liberalized type of socialized medicine in the Scandinavian countries and in Great Britain.

I have no doubt that some form of socialization is facing us. Large groups of the public want socialized medicine. Political parties are not averse to baiting their platforms with this promise. Even our medical profession is in tacit agreement by accepting various insurance plans such as Blue Cross or other similar medical care programs. Accordingly, we have more or less agreed, if not to the philosophy at least to a form of socialization.

Therefore the challenge is: will we be able to maintain within the rigidity of further socialization that freedom and initiative which are essential to continue the rate of advance which we have made in the past? Will we exert the requisite wisdom, courage, and co-operation? It will not be easy!

Sir Francis Walshe, ex-president of the Royal Society of Medicine in London said recently: "Thrice within my own professional life has our profession vigorously, even vociferously, stood out for a while against certain Government proposals designed to bring us within a narrower framework and one, more subordinated to the State. Yet, each time we have fallen back, disunited, disgruntled, defeated and acquiescent."

On account of fear of further socialization there is another disquieting situation. Both in America and in Britain we have experienced a significant fall in the numbers of desirable applicants for medicine. In 1946 statistics from England showed that the "cream of the crop" applying for university education was predominantly in the field of medicine. Ten years later it was shown that medical applications, from what we consider Grade A students, had slipped behind those for the fields of Commerce, Law, and Engineering. Though figures are not so marked, similar trends are evident in America. One of our journals recently stated:

"It is evident by the slump in medical school enrolment that young men are becoming more aware of the struggle and difficulties of medical practice and, with the inherent shadow of a national health scheme ever-present, they are definitely looking to other fields."

At the beginning of this lecture I referred to the large numbers of American students who had sought postgraduate education in Europe. But today, what a change! Only the occasional student travels to Europe for final education. Yet America is flooded with thousands seeking special training in many fields. No country in the world can equal our facilities. Surely the present situation with the reverse flow of interest should serve as a warning to those who are agitating. Free Enterprise, in spite of some visible blemishes, has still more to offer than others under systems which cannot demonstrate the progress which we are privileged to witness in our very midst.

But full share of blame for falling application numbers must not be placed on the doorstep of "Mister Socialist." There are other reasons. First, we should cast an analytical eye toward our teaching methods. Second, we should study our personal approach to the public, whether he be patient or patron.

*Medical education.*—Even in a scholastic sense we live in troubled and heart-searching times. During the last few decades education in general and medical education in particular has been subject to scrutiny and revision. Everywhere there has been academic unrest and dissatisfaction. Our educational system continues to be at fault.

But there are some bright spots on the horizon! There is emerging a growing realization concerning the importance of the profession of teaching. Very slowly, and at the eleventh hour, are we in the Western World, being forced to regard teaching as the most important of all the professions. Another hopeful indication is that many medical schools have already revised their curriculum.

But there must be further study and more removal of outworn methods. There should be a replacement by teaching those subjects which will afford a thorough grounding in basic necessities. Less emphasis should be placed on the unusual and esoteric.

In my opinion, some of the many hours set free by this process of deletion should be occupied by study of the humanities. This recommendation is emphasized by a renowned figure in education. He writes:

First of all there must be the general desire to turn out something more than a medical ignoramus, that is, a man who knows too much about medicine and too little about anything else. We would like our graduate to be literate enough to appreciate the odd allusion to the Bible or Shakespeare, and articulate enough to express himself in clear and reasonably grammatic English.

This being our aim—how can we integrate to our purely medical studies the wisdom of the ages and the courageous example of our ancestors as revealed in history, literature, philosophy and science? Surely not by confining their teaching to those first most immature years of the student's college life and then neglecting them entirely during the total medical course.

Few things can have a more maturing effect on a man's mind and emotions than contact with human woes and suffering. Experience such as this comes only during the later years of his purely medical studies. This is the time when he should be exposed to literature, history and philosophy so that his rapidly maturing mind may feed on a richer diet than mere human pathology.

We must emphasize to the student, that, for the properly prepared doctor, a knowledge of Man is as important as the knowledge of Man's diseases.

This brings me to the final part:

*The art of medicine.*—In bygone days Robert Louis Stevenson wrote:

There are men and classes of men that stand above the common herd; the soldier, the sailor and the shepherd not infrequently; the artist rarely; rarer still the clergyman; the physician almost as a rule.

But today there is a challenge! We do not have the universal popularity which was enjoyed by our predecessors. Deficiencies of personal relations, some adverse publicity, and changing economies all tend toward lowering the doctor's position in the community.

No long ago it was written:

Modern medicine should be established on broad lines—the conception of medicine as an art—based on accurate observation, and as a science,—an integral part of the science of man and of nature.

Somatic medicine tends to become more and more a cut-and-dried science and less and less an art. On the other hand, since psychosomatic medicine deals fundamentally with morals it must remain permanently an art. Due to the fact that we tend to burrow deeper and deeper into the watertight compartments of our individual specialties we miss the haven of a great opportunity.

No one looking at the future of medicine can disregard the potentialities of psychology

and psychiatry. Perhaps the most exciting expectations for the future lie in this direction. To refer to my own specialty—obstetrics and gynecology—future advances in this direction are inevitable. It has been shown that present treatment is too surgically-slanted in many conditions where there is evidence of emotional cause; spontaneous and habitual abortion, toxemia of pregnancy, various benign uterine bleedings, dysmenorrhoea, sterility, frigidity, and so on.

But we should not dump these clinical problems into the lap of the already overworked and understaffed departments of psychiatry. It would be much wiser to encourage or even coerce the departments of psychiatry to send their men into the various clinical departments. We would learn from them and they would learn from us. Most important of all, the medical student would be taught in a better way than by the present disjointed method which is almost by remote control.

Actually, this cooperative system should not be confined to psychiatry. In a major clinical department as my own, our efficiency would be increased by inclusion on our *immediate* staff of men trained in other specialties. We would benefit considerably by inclusion of an internist, psychiatrist, urologist, endocrinologist, and pathologist.

But one word of caution! You all remember the famous tale of "Aladdin" and the enticement of new lamps for old. There should be no sudden, no thoughtless surrender of the old merely because it is old, or a hurried and reckless seizure of the new simply because it is new—sound thinking and sane judgment should be in evidence before any change is made.

Because John Harris was truly a religious man I chose to introduce my presentation with the words of Ecclesiastes—The Preacher. And, due to the fact that we are assembled for the express purpose of paying our respects to this man who made full use of all his talents it is appropriate to conclude with the words of Sir William Osler.

THE PHYSICIAN: I have loved no darkness  
Sophisticated no truth  
Nursed no delusion  
Allowed no fear.

*Note.*—In preparing this lecture I have taken excerpts and ideas from two outstanding presentations which have been published recently.

1. Atlee, H. B. A Teacher's Eye Vision of the Future of Medicine. *Can. M. J.*, Vol. 80, No. 1, Jan. 1, 1959.
2. Ravdin, I. S. Medicine and Its Relation to Free Enterprise. *Bull. Am. Coll. Surgeons*, Jan.-Feb., 1959, No. 1.

## Reports

### STATUARY HALL—ITS WOMEN AND ITS DOCTORS

ELINOR BLUERMEL\*

Statuary Hall in the National Capitol is the nearest thing Americans have to a Pantheon to receive statues of famous Americans of days gone by. The statues deposited there are the gifts of the various states and are limited in number to two from each state, the first of them only being located in the Hall itself. The second statue is placed in one of the various locations designated to receive them—the Rotunda of the Capitol, the Senate Connection, the Vestibule south of the Rotunda, the Vestibule facing the old Supreme Court Chamber, and the Hall of Columns—although originally all statues went into Statuary Hall proper.

When the United States House of Representatives moved into its new quarters in 1857, the question arose as to what was to be done with the old House Chamber, and in 1864 it was set apart for the reception of memorial statues from the states. Under a law creating Statuary Hall, known as the Act of July 2, 1864, which provided that "suitable structures and railings shall be erected," the statement was made that "the President is hereby authorized to invite each and all the States to provide and furnish statues in marble or bronze, not exceeding two for each State, of deceased persons who have been citizens thereof, and illustrious for their historic renown."

By 1933, however, the Hall had become so crowded and the danger to the structure was so acute that Congress passed a Resolution to provide for the relocation of statues and declared that hereafter "only 48 statues shall be placed in Statuary Hall; the others to be located elsewhere in the building, the first of the two statues to go into Statuary Hall." By 1959 some states had completed their quota of statues, some had donated only one. Only Colorado, Nevada, New Mexico, North Dakota and Wyoming had not contributed any; and on February 26, 1959, Colorado dedicated its first statue, that of Florence Rena Sabin, M.D.—"teacher, scientist, humanitarian." Dr. Sabin was the third woman and the sixth doctor to have a statue placed in the Hall.

The first woman to make her appearance in Statuary Hall was Frances Willard (1838–1898), whose marble statue was presented by Illinois in 1905. She stands beside a sort of pulpit, for she was a born preacher and a famous orator for reform. "She had the art of putting things." She was an educator, for 1 year president of the Evanston College for Ladies, then dean of Northwestern University, the first coeducational college to admit women on the same terms as men. Frances Willard was an ardent woman suffragist, and she was active in national politics. Perhaps her greatest single claim to fame was that she was the founder of the Woman's Christian Temperance Union and author of its Declaration of Principles, later becoming its President and helping to found the World W.C.T.U. At the dedication of her statue a thousand children passed before it, each one dropping a blossom at its base until Frances Willard stood knee-deep in flowers.

It was not until late 1958 that the statue of another woman was placed in Statuary Hall,

\* Author of *Florence Sabin: Colorado Woman of the Century*. University of Colorado Press, 1959.

a bronze statue of Maria L. Sanford (1836-1920), the second gift of the state of Minnesota. Maria Sanford also was a teacher, first in grade school and later at the University of Minnesota, becoming eventually a leader in early adult education. Like Frances Willard, she was interested in women's rights; but her closest association with any organization was with the Daughters of the American Revolution, for whom she wrote the well known Apostrophe to the Flag.

The third woman to make her appearance among the nation's great in Statuary Hall was Dr. Florence Rena Sabin (1871-1953), whose bronze statue was presented February 26, 1959, by the state of Colorado, a representative not only of women, but of the profession of medicine. Her statue is in the Hall itself, since it is the first to be presented by her native state. Like the other two women, Florence Sabin was a teacher; but she had the added distinction of being also a teacher of medical students and was the first woman to be made a full professor at the Johns Hopkins Medical School. She was, too, the first woman to be invited into membership in the Rockefeller Institute for Medical Research, the first woman president of the American Association of Anatomists, and the first woman member of the National Academy of Sciences. Besides her earned degrees, she received fifteen honorary degrees and was one of the dozen most famous women of the twentieth century. Like the other two women in Statuary Hall, Florence Sabin believed in women's rights, but she was a leader of both men and women, particularly in the field of medical research. She authored more than a hundred magazine articles and one full-length book.

The first physician to appear in Statuary Hall, and in the Hall itself, was Dr. John Gorrie of Florida (1802-1855), whose marble statue was presented by the state in 1914, a tribute to his skill as a physician and an inventor. Dr. Gorrie developed the first process for air conditioning, making hot countries and particularly sickrooms in those countries livable. Dr. Gorrie's original experiment on air cooling took place while he was preparing a series of papers for the London *Lancet* on the subject of Equilibrium of Temperature as a Cure for Pulmonary Consumption. By the year 1850 he had succeeded in producing small blocks of ice about the size of building blocks, and he is said to have secured the first U.S. patent on mechanical refrigeration. It is interesting to note that his original experiment took place a dozen years before the much publicized invention of M. Edward Carré in Paris in 1855. Dr. Gorrie did not exploit the commercial possibilities of his invention, since he was concerned with the comfort of the sick. He wrote, however, under the nom de plume of Jenner, a series of articles on the *Prevention of Malarial Diseases* and a book entitled *Dr. John Gorrie's Apparatus for the Artificial Production of Ice*. His statue bears on its base the two words—"Physician, Inventor."

In 1926 the State of Georgia dedicated a marble statue of Dr. Crawford W. Long (1815-1878), with the inscription on its base "He saved humanity untold suffering by introducing anesthesia in surgery," and designating him Physician and Surgeon. The statue is in the Senate Connection. Dr. Long is credited with being the first to use ether in surgery, in 1842, and the tribute given at the dedication ceremony was made by Dr. Joseph Jacobs, a former employee of Dr. Long. It is said that Dr. Long's dominating characteristic was tending strictly to his own business; he did not go out to meet trouble or win fame. He was a simple country doctor and made no attempt to publicize his discovery, even during the long controversy about it. He did not take time to write up his experiments on the use of sulfuric ether until 1849. "If I can not say a good word for a person," he said, "I will say nothing." Dr. Long's statue depicts him wearing a frock coat, and one can well imagine that his vest was white; for he

wore a white vest religiously from the first day of May until November first. He was known as the "physician's physician," and he once said, "My profession is really a ministry from God."

The large bronze statue of Dr. Ephraim McDowell (1771-1830) was presented by the State of Kentucky in 1929, and stands in the Senate Connection. The inscription on its base reads, "First surgeon ever to cut into abdominal cavity and remove ovarian tumor," and the titles applied to Dr. McDowell are Pioneer, Scientist, Surgeon. The statue represents him as he must have appeared on state occasions, with a stock and ruffled linen. Dr. McDowell, too, was a country doctor, and his patient for his first ovariotomy rode 60 miles on horseback for the operation. This was before the days of ether, and Dr. McDowell and his patient shared true pioneering together. Dr. McDowell, though a backwoodsman, had gone to Edinburgh University and had come under the instruction of Dr. John Bell outside the University itself. The peritoneum was at that time held more or less in awe, and the subject of ovariotomy was an academic one until Dr. McDowell performed his first operation some 14 years after he had returned to Kentucky to begin the practice of medicine. Because of the fact that he did not hold an M.D. degree, he was exposed to doubt and contempt when he first published the record of his cases, after which it became apparent that his success was not due to mere chance, as some of his critics had insisted. His only published works were his two reports in the *Eclectic Repertory* and *Analytical Review*.

Two physicians entered Statuary Hall in 1953, from two western states. The statue of Dr. John McLoughlin of Oregon (1784-1857) in the House Connection bears the inscription, "Though agent of a British Corporation he encouraged Oregon settlement by Americans," and he is identified as "Colonizer, Empire-BUILDER." On the base of his statue are the words "Eminent Physician and Surgeon." His statue is an enormous bronze one, showing him with his high beaver hat in one hand, his coat billowing out behind him, a cane in his other hand—a man with a purpose. The story of Dr. McLoughlin is the story of fur-trading days in the Pacific Northwest and of the Hudson's Bay Company. He was born in Quebec and began his medical apprenticeship at the age of 14, being admitted to the practice at 19. When the assets of the North West Fur Trading Company fell to the Hudson's Bay Company, all the property west of the Rocky Mountains was included, and in 1824 Dr. McLoughlin was appointed head of this region, known as the Columbia District. He was considered the representative of the British interests in the Pacific Northwest, opposed to American settlement there; but when in 1843 the first overland train of American settlers arrived, he welcomed them, even though he realized that this meant the end of the fur trade and the eventual possession of that part of the country by the Americans. Dr. McLoughlin resigned his position in 1845 and declared his intention of becoming an American citizen. In 1846 the treaty was signed establishing the 49th parallel of north latitude as the dividing line between what is now Canada and the United States west of the Rocky Mountains.

Dr. Marcus Whitman (1802-1847) appeared in Statuary Hall itself in 1953, the statue of him being presented by the state of Washington. He was first Christian Missionary to the Pacific Northwest, and is called Missionary, Colonizer, Doctor. The sculptor makes him typical of what he is described to have been, and the statue is the largest in the entire Statuary Hall collection, being 8 feet tall. Dr. Whitman is wearing his fringed buckskin suit, his fur hat, and has in one hand a Bible, in the other his saddlebag and his plans. On the base of the statue are the words, "My plans require time and distance." Dr. Whitman began the study of medicine in New York state, and "rode out" for several years with an experi-

enced doctor, later receiving his diploma from Fairfield Medical School and establishing a horseback country practice in upper New York. He longed, however, to be a medical missionary in the West, and in 1835 made his first exploratory trip, after which he and his wife went to Oregon Territory and established a mission there, working with both Indians and white people. Their efforts ended in tragedy, for they were massacred by the Indians in 1847. It was Dr. Whitman's work as a physician that led to his death. The Indians, particularly susceptible to measles, became alarmed at the number of deaths that were occurring among their people and blamed the "Good White Doctor" for them. Dr. Marcus Whitman, a martyr to the medical profession, was the first graduate doctor of a medical school to practice west of the Rocky Mountains.

It was the Colorado Division of the American Association of University Women that spearheaded a drive to have Dr. Florence Sabin's statue placed in Statuary Hall. After her long teaching career at the Johns Hopkins Medical School and her brilliant scientific career at the Rockefeller Institute, Dr. Sabin came home to Denver at the age of 67, supposedly to retire; but eventually she, too, became, in her seventies, a country doctor—a different kind of country doctor from the others in Statuary Hall. She stumped the state of Colorado by bus and motor car in the interests of better health and brought about the formulation and adoption in the State Legislature of the celebrated Sabin Health Bills. The statue of her, however, shows her sitting in her laboratory, wearing her laboratory coat and turning with a half-smile on her face as though asking characteristically, "Come, see what I have found." All her life Dr. Sabin led people to find out things for themselves, and she became known as a great humanitarian. Florence Sabin is worthy of being added in 1959 to the roll of women and of doctors in Statuary Hall.

## MEDICAL EDUCATION IN TEHRAN, IRAN

GEORGE A. WOLF, JR., M.D.\*

During the spring of 1958, the University of Tehran Faculty of Medicine requested through the International Cooperation Administration's (ICA) Operations Mission to Iran that a consultant in medical education visit and make recommendations concerning the institution of a new curriculum.

The author subsequently spent 6 weeks in Tehran and prepared a report. It is of some interest that the University of Shiraz made a similar request a year ago, and Dr. Benjamin K. Horning, Regional Medical Education Consultant in Latin America for ICA, visited this University and proposed certain curricular changes corresponding to those found in American medical schools. The University of Shiraz has put most of his recommendations into effect at the time of this writing.

Iran is a large country, approximately one fifth the size of the United States, with a population of 20,000,000. Its largest city, Tehran, with 2,000,000 people, is the capital city and the home of the king, Shah Mohammed Reza Pahlavi, who heads the constitutional monarchy. The country, which is primarily agricultural, is in an early stage of industrial development. A great deal of building is going on. Natural resources are being developed. Irrigation and hydroelectric projects are appearing.

The geography of the country is varied. Along the Persian Gulf Coast where most of the oil is found, the climate is tropical. On the central plateau which is arid and mountainous, the climate is like our southwestern United States. In the north, bordering the Caspian Sea, semi-tropical forests and rice plantations are found.

From the standpoint of medical care, parasitic and infectious diseases are common. Public Health practices and provision of medical care are limited by the fact that the majority of the population lives in approximately 40,000 small, isolated villages.

Tehran is a modern city where doctors and others of the professional and upper classes tend to congregate.

*University of Tehran Faculty of Medicine.*—Although the medical history of Iran is studded with names such as Avicenna and Razi, and some training in medicine was offered at the Darolfonoun College in Tehran, beginning in the last century a full Faculty of Medicine was developed at the University of Tehran by Reza Shah. Its beginnings were marked by sending promising young men to Paris for training. Thus, the Faculty of Medicine, for the most part, operates according to the French system as it existed some years ago. Students are admitted, by competitive examination only, to the Faculty of Medicine after completing secondary school. These students are said to be comparable to our Junior College graduates. The competitive examinations are concerned with languages, biology, physics, and chemistry. From approximately 4,000 applicants, 300 are accepted by the medical faculty annually. Once accepted, a student is rarely dropped by the faculty. Although the early years of the 6-year program are concerned with medical physics, biochemistry, biology, anatomy, for the most part the students have had little or no laboratory training in second-

\* Dean and Professor of Clinical Medicine, University of Vermont College of Medicine.

ary school. Thus, much of the course content is directed either toward indoctrinating students into the laboratory techniques or presenting the applications of these basic sciences to medicine. Some of the students are well grounded in the theoretical aspects of chemistry and other basic subjects, but much effort is put into learning structural formulae and similar information requiring rote memory.

Pressure to produce physicians has led the Faculty to accept students beyond the number which can be accommodated by the facilities available. Thus a good deal of time is spent in lecturing and less in the laboratories and at the bedside than would be possible if the number of students was more in keeping with the size of the facilities and staff.

Of the many problems which medical education faces in this rapidly developing country, possibly two are of the greatest interest.

*The status of the medical profession.*—The direct admission of students from secondary schools to the Medical Faculty of the University results in widely varying degrees of preparation of the students for medical college work, as well as varying levels of general education. This is probably especially true in Iran and other parts of the Middle East, because of the great difference in the cultural and educational resources of the larger cities and of the many, many small villages. A large part of the effort of the Medical Faculty must be spent in leveling these differences. For example, one professor said that some of his students were unable to use pipettes and other simple instruments of the chemistry laboratory. The opportunity to study cultural background or general educational preparation in entering students was not available.

The impression was gained that the great differences in many areas between the larger cities and the small villages led young physicians to settle in cities and concern themselves primarily with therapeutic medicine. Although in the United States relatively few of our graduates are directly involved in preventive medicine and public health, and many practice therapeutic medicine and settle in large cities, the differences between the smaller towns and larger cities here are not nearly as great from the standpoint of culture and facilities as they are in Iran. The problems of improving public health in under-developed countries, it may be deduced from this experience, are numbers of available professional medical skills, their distribution and quality.

The medical profession in Iran as in many countries carries with it a great deal of prestige, and many of the dignitaries in the land have had a medical education. Thus medical education often becomes a pathway to success in political, social, and financial life rather than a means of improving the total health of the population. Moreover, at top governmental levels, the thinking is that the health of a population bears a direct relationship to the number of doctors disregarding problems of distribution, quality, and the job to be done. As in the United States, inducements to practice in rural areas, with the connotations of indentured service, point to the feeling that a doctor in every town, regardless of the medical needs, is the cure-all for health problems.

What is needed is as many physicians as possible of high quality who are knowledgeable in the various fields of medicine. These men should be sufficiently educated and specially trained to devote their efforts to solving the medical problems of the people of Iran. For example, there is no virtue at this time in making Tehran a medical center comparable to New York or Chicago when villagers have remained on their home ground for centuries and do not travel to medical centers.

Under the direction of physicians, the problems of health peculiar to Iran should be stud-

ied and means devised to meet them. They can start with the realization that the anopheles mosquito can coexist with the physician in every small town better than it can with DDT and that cardiac surgery on the tent floor is not feasible. The mosquito extermination team member, the public health nurse, nutritionist, sanitarian, and others must be brought into the picture in proper perspective. The inadequately trained mass of "physicians in every town" must not be looked upon as the solution to the health needs of Iran or of the United States.

*Language.*—The second great problem is language. The language of Persia is called Farsi and is spoken in a relatively limited area of the world. The majority of the students at the University of Tehran use the local language, and the teaching is in this language. As a result, much of the world literature is unknown to the students, and a great deal of time is spent by the faculty translating or summarizing medical literature into Farsi. The medical literature in Farsi written by Iranians is extremely limited, there being one medical journal which has been in existence only a few years. Many of the Faculty are multi-lingual, but for the most part they know one other foreign language, most commonly French. Thus, one of the textbooks written in Farsi had several hundred references, but all were from the French literature. This situation has resulted inevitably in the authoritarian approach to teaching, although there may be other reasons for this. In general, the word of the chairman in a given subject is final. Until the contents of the world's medical literature can be made available to the students, it is difficult to see how this authoritarian attitude can be done away with.

The University of Shiraz College of Medicine has adopted English as a teaching language and is building its library accordingly. It might be said at this point parenthetically that it is fortunate for us in the United States that much of the world medical literature is in English and that English is developing some of the characteristics of an international language.

It is distressing that during the trip abroad the author came into contact with nationals from some eight or ten different countries, all of whom spoke English, while he had an elementary or no knowledge of their native languages.

In general, the definite impression was gained that the problems faced at the University of Tehran could not be solved solely by money. There is no question that poverty is one of the serious problems of the country, and there is no question that the Faculty of Medicine could use effectively additional funds, but money alone is not the panacea.

## TEACHING OF MEDICAL STATISTICS

REPORT ON THE SOUTH AMERICAN CONFERENCE\*

SÃO PAULO, BRAZIL, JULY 22-28, 1958

A South American Conference on the Teaching of Medical Statistics sponsored by the Pan American Sanitary Bureau, Regional Office for the Americas of the World Health Organization, in collaboration with the Faculty of Hygiene and Public Health of the University of São Paulo, brought together staff members of schools of medicine and of public health from Argentina, Brazil, Chile, Colombia, Ecuador, Peru, and Uruguay. With the increasing recognition of the importance of statistics to the medical profession and of the wide applicability of statistical methods to medical research, the need for improving teaching in medical statistics has become a matter of urgency in medical education. The Conference was designed as one step in meeting this need.

The present status of the teaching of medical statistics in South America, objectives of such instruction, and existing medical school resources and organization were outlined and defined at the Conference. Of the recommendations which resulted from the discussions it was recognized that most urgent is the need of training teaching personnel. The importance of close cooperation among the various medical statistics groups in South America was emphasized.

At present, according to the Conference, the teaching of medical statistics in the South American medical schools is not satisfactory. In a great proportion of the schools there is no regular instruction in statistics, and in almost all, none existed 3 years ago. Statistics, whenever taught, appears associated either with the basic medical sciences departments or with the department of preventive medicine. Only in a few schools is instruction given throughout the medical curriculum. The level of teaching in all cases is elementary, with deficiencies in both teaching personnel and equipment. There are few full-time professors in medical statistics. Interest on the part of the various departments in statistical consultation and advisory services is found to increase proportionately with the development of teaching of statistics.

### Bases for a Teaching Program in Medical Statistics in South America

According to the conference participants, teaching of statistics in medical schools is necessary because every physician needs to know, as part of his preparation as well as in the exercise of his professional activities, the characteristics and limitations of the scientific method and the role of statistics therein. Students rarely receive adequate instruction of this type in their pre-university education. It is hoped that courses in statistics will provide bases on which the student and the physician will develop objective and discriminating attitudes so indispensable in their work which, for the physician, may be analyzed as follows. In general, the physician needs to make decisions based on observations which are variable, are influenced by multiple factors, and are subject to error, to keep himself informed on the progress of his profession by the study of selected papers from an extensive literature about

\* The full report of the Conference appears in the original Portuguese in the Boletín de la Oficina Sanitaria Panamericana, Vol. 46, No. 2, pp. 109-17, 1959.

which he must form his own judgment, and to carry out investigations of the relationships among factors which interest him, especially causative or determining factors.

The following would then be the objectives of the teaching of statistics in schools of medicine: to develop scientific attitudes in the medical man, as student and as physician, to give him practice in elementary statistical techniques so that he may appreciate accurate recording of observations and judge the validity of conclusions, and to inform him of the existence and importance of basic data in health statistics and of his responsibility as the source of most of these data.

To accomplish this there is needed a nucleus of people capable of providing statistical teaching, with functions as follows: (a) teaching of statistics to medical students, physicians, teachers, researchers and to those in the allied professions, (b) collaboration with the various departments in the school of medicine, such as statistical advisory services in medical research; (c) collaboration with other institutions, such as the health services, in the study of problems of mutual interest, and (d) research in statistical methods applicable to medicine.

*The teaching program.*—In describing the teaching program, it was considered that the teaching of statistics should begin in the first 2 years and continue throughout the medical school course, advantage being taken of all opportunities to introduce the applications of statistics to the different branches of medicine. The applications of statistics to public health should be taught in the final years. All teaching should give greater emphasis to the acquisition of concepts than that of techniques.

Although the content of the basic course varies with local conditions, the teaching of statistics should include principles of collection, processing, presentation, and elementary description of the data, as well as the presentation of problems of inference by means of objective examples.

A typical program is as follows: (a) principles of the scientific and statistical method, (b) techniques for data collection (experiment design, sampling, sources of error, etc.), for processing (types and classification of data, i.e. qualitative and quantitative), for tabular and graphic presentation, and for summarization and description of the data (proportions, averages, measures of variability, some concepts of regression and correlation), (c) statistical inference (concept, importance and bases): sampling errors, their application in the estimation of parameters, and tests of significance of proportions and means (independent and dependent).

The program outlined for the basic course can be developed in twelve or fifteen sessions of 3 hours each, devoted principally to practical exercises with active participation of the student. The material of the program should be treated in an elementary manner and should be adequate for the types of problems which the medical student encounters during his studies and later in his professional activities.

The teaching of health statistics should be carried out in the last years of medical study and should stress the methods of obtaining these data, the fundamental role of the physician in obtaining the data and the importance of the reports which are based upon the data. The following program may be suggested: definitions, collection, and analysis of data regarding population, environment, mortality, natality, morbidity, resources, and services; statistical organizations which furnish these data; the availability, function, and participation of the physician in these organizations; appropriate statistical techniques, such as rates and indices, application of the life table to chronic diseases, etc. This instruction could be given in six to eight sessions of 3 hours each, devoted principally to practical exercises.

There are numerous opportunities throughout the medical course for the teaching of statistics in collaboration with other departments. For example, topics in genetics offer an opportunity for discussions involving the binomial and *chi square*; the planning and interpretation of experiments may be discussed in pharmacology with reference to biological assay; the statistical problem of evaluation of diagnostic and therapeutic means may be approached in clinical medicine.

As an orientation to teaching, the following points should be remembered: (a) Teaching of medical statistics requires special care so as to awaken from the beginning the interest of the student. Interest may be created by careful selection of the examples and applications of the method, in the sense that they should be real and tied in directly to his medical studies. It is also important to adopt the practice of pointing out, whenever possible, the direct usefulness of the statistical method to the physician, the errors that may be avoided by its application, and the dangers of its misapplication. The use of complicated symbols and of mathematical deductions should be avoided. (b) Active teaching methods are most important in forming attitudes, in fixing knowledge, and in developing skills. Group techniques stimulate student activity and should be widely used. (c) The teaching of statistics in a faculty of medicine may be done with a minimum of material. Specialized texts in the local language must, nevertheless, be made available.

Statistical activities in a school of medicine require at least one full-time medical statistician. There should be a sufficient number of auxiliary personnel to satisfy teaching and other needs of the statistical nucleus. The nucleus may have an autonomous character or be incorporated in some department of the school of medicine, in accordance with the local organization. It should have the necessary space, equipment, and administrative personnel for adequate performance of its functions. It should have its start in personnel versed both in the statistical method and in the medical and biological sciences. As the nucleus is enlarged specialized personnel could be added, in view of the diversity of functions to be performed, without the nucleus losing sight of the applicability of statistics to the medical sciences.

The following recommendations were made for the improvement of teaching of statistics in medical schools, mindful of the differing degrees of development that exist: (a) In medical schools without statistical activities it is of course necessary to awaken interest in the faculty. For this purpose visits, courses, and lectures by professors and consultants from national and foreign centers could be used. Efforts should be made at the same time in locating persons who are interested in this field, in giving them an opportunity for basic apprenticeship in appropriate centers, and in making facilities available so as to introduce the teaching of statistics in local schools. (b) While this initial strategy is under way the formation of the statistical nucleus should be encouraged by obtaining material resources and other means that could contribute to its formation. It is desirable to have a continuous program of professional training of the members of this nucleus so as to attain a suitable technical level. (c) Within each country the exchange of professors, meetings of statistics teachers, etc., will be useful. (d) It is foreseen that international organizations would contribute to this plan through a scholarship program for sending selected medical school personnel to centers in South America, through consultants experienced in the teaching of medical statistics who could contribute to and stimulate interest in the training of teaching personnel, and through the translation and distribution of texts suitable for medical students. (e) The widest pos-

sible distribution should be given to the report of this Conference. The Pan American Sanitary Bureau is requested to give the present document, which constitutes useful information on the problem, adequate distribution to the governments and to all agencies interested in and responsible for medical education in the countries of South America.

*The role of the physician in providing health statistics.*—Under this heading, the general factors which influence the production of health statistics and which relate to the historical, economic, social, institutional, and health development of the communities were discussed. With respect to the physician's role and its importance, attention was directed only to two subjects, namely, the function of the physician in the production of health statistics in his community and the causes of the present deficiencies in health statistics with the recommended measures for correction with reference to the schools of medicine.

The responsibility of the physician toward health statistics goes beyond his participation in providing data on his community. It includes, for example, his collaboration in fostering the adequate recording of information, and in maintaining and improving existing statistical systems.

Without health statistics, it is not possible to plan effective programs for the improvement of the health of communities nor to evaluate properly the results of these programs. These statistics produced under the direct responsibility of the physician are of decisive influence. Among these may be mentioned birth, death, notifiable disease statistics and clinical records.

The existing deficiencies in health statistics relating to the physician derive essentially from deficient instruction on the role he plays in the production of health data, as well as from misconceptions regarding the importance and use of these data. The following recommendations are offered to the schools of medicine:

1. The teaching of statistics in the departments of preventive medicine should be carried out in close collaboration with the clinical departments, taking advantage of the clinical pathological conferences, the discussions of cases in dispensaries and out-patient clinics, etc. Thus, for example, the discussion of medical certificates of births and fetal deaths is appropriate in the departments of obstetrics and of pediatrics and instruction on the reporting of notifiable diseases in the communicable diseases department, etc. Generally, the discussion regarding certification of death and the reporting of notifiable diseases should be considered a necessary complement to the teaching of clinical medicine and brought to the medical student through collaborative efforts of the preventive medicine and clinical departments.

2. It is desirable that medical schools participate, as members of the scientific community, by interesting physicians in community health affairs, offering opportunities to keep them informed and stimulating them to their best performance in society.

3. It is necessary to promote the distribution and use by the departments of preventive and of clinical medicine of the available material on health statistics.

Since the existing statistical systems are imperfect it was suggested that physicians stimulate the revision and improvement of these systems for the simplification, rationalization, and wider use of health statistics.

*Summary.*—Statistics is an essential in the training of the physician, since it contributes to the development of scientific attitudes, provides elementary knowledge regarding collection and analysis of data, and develops an awareness in the physician of his responsibilities as the primary source of important information on health and vital statistics. The teaching

of statistics ought to start with a basic course early in the medical curriculum to be followed in later years by the applications of statistical techniques to the various components of the medical curriculum.

Methods of teaching ought to be adopted which awaken the interest of the student in statistics, give him ample opportunities for active and practical work, and facilitate the acquisition of the desired attitude, skills, and knowledge. The teaching is best carried out in the schools of medicine which have a nucleus of full-time statisticians adequate in number and quality for the development of the following three activities: the teaching of students and similar groups, collaboration on research projects within and outside the school, and direct statistical research. Teaching ought to be in collaboration with persons from other disciplines so as to obtain the desired integration.

The first steps in the improvement of the present situation are to awaken interest in statistics in the medical school staff and to give basic preparation to persons who may be in a position to teach. It is advisable in the more advanced phases to form a statistical nucleus of people, taking advantage of opportunities for further training so as to bring the teaching to the desired level of knowledge.

In South America there are centers for training in medical statistics at various levels and in many fields that must be utilized on national and international scales to remedy the scarcity of teaching personnel which constitutes the most pressing problem. International organizations can contribute to the realization of this plan.

## ABSTRACTS FROM THE WORLD OF MEDICAL EDUCATION

ANGELA SANCHEZ-BARBUDO, PH.D.  
Abstract Editor

**Central African Medical School.** British Medical Journal, pp. 1024-26 (April 18), 1959.

Three years ago, the University College of Rhodesia and Nyasaland appointed a planning committee to advise "on the desirability and practicability of establishing a medical school as an integral part of the College"; to outline a curriculum, and to make other recommendations. This committee has now produced two reports, the contents of which are discussed in this paper. In Nyasaland, existing medical services are inadequate, but finances available do not allow expansion of staff and clinics at the same time as provision of a medical school. The planning committee, considering it foolish—as stated in its first report—"to add to the superstructure when the foundations are faulty" thought that to devote the present resources to immediate improvement of medical services would be "dangerously shortsighted"; and that only by setting up a medical school as the essential foundation "can a continued improvement come about both in the quality and the scale of the health services." This opinion, it is pointed out, has a significance for Britain as well as for the Central African Federation as a "clear and much needed statement of the importance of medical education," and a timely reminder (after a decade of the N.H.S.) of what the National Health Service owes to British medical education. The second report discusses the design of the medical course in the proposed Rhodesian school (the suggestions made are also most pertinent to British medical colleges, since

all 26 of them are actually engaged in curricula reforms). The planning committee has outlined a course of study leading to a qualification registrable by the British General Medical Council. Taking into account the special needs of the African Federation, it also concerned itself with all the major problems of medical education which British schools of medicine must face. Of special value for those now planning curricula in Britain is that the committee defines first its aims and educational objectives and then devises a course of studies which it hopes will result in their attainment. The purpose of each phase of the course is clearly stated, and techniques of teaching are suggested. This dynamic plan, concerned "with the general shape and spirit of the syllabus" rather than with the details of printed regulations, is based on the belief that the attitude of mind of the teachers is more important than the time-table. The committee recommends that during the second and third years one-sixth of the student's time should be given to clinical and pathological studies, while anatomy and physiology should continue to be taught during the 3 clinical years; teaching of anatomy, physiology, and pathology should be closely integrated. In the clinical years, the fullest use of the English system of teaching *firms* is advocated, that is, a practical clerkship in which teaching is based "upon the sense of participation rather than the relationship of master and pupil." A firm effort is also made to reduce the content of factual knowledge. Aware that the success of such a plan depends largely upon the interest and ability

of the teachers, the committee takes great pains to outline the type and number of clinical teachers the school should have.

**Recent Achievements in the Promotion of Traditional Chinese Medicine.** Chinese Medical Journal, Vol. 78, No. 2, pp. 103-105, 1959 (Peking).

In 1955 and 1956, the Health Department of China established in six principal cities (including Peking, Shanghai, and Chengtu) 2½-year courses giving systematic theoretical and clinical training in traditional Chinese medicine; short-term and spare-time courses have also been organized. These measures followed the Chinese Communist Party's directive emphasizing the study of traditional medicine by western-trained doctors, as well as greater cooperation between physicians of the two schools. As a result, several thousand "western style" doctors have already become familiar with some of the elementary skills of traditional medicine, improving considerably—according to this report—the quality of their medical work. Some diseases for which western medicine has no cure can now, allegedly, be treated with good results by traditional methods or by a combination of both ancient and modern therapy. It is also pointed out that "western style" doctors in many hospitals, after studying the traditional therapeutic methods, are now able to cure acute appendicitis without surgery (following the prescriptions of Dr. Chang Hsü, a traditional doctor at the Goldmine Workers' Hospital in Kivin). In some cases of glaucoma, cataract, and nerve deafness, traditional methods are also said to have proved successful. Furthermore, while it is hoped that the study of traditional medicine by doctors of the western school will also help to raise it to a higher level, it is expected, at the same time, to heighten "the political consciousness" of western-trained physicians. Some of them, it seems, found it difficult at first to accept the Communist Party's policy, because they despised traditional medicine and considered it a waste of time to learn it. However, this editorial emphasizes that

these same physicians, once they had gained knowledge of traditional medicine and its application in clinical practice, have become convinced of the "correctness and farsightedness" of the Party's measures. Furthermore, since knowledge of specific remedies and practical medical experience is possessed by people in all walks of life, a popular campaign has been launched recently in many parts of the country "to seek out the wise and collect tested and secret remedies." In response to this call, numerous old traditional practitioners, pharmacists, barbers, peasants, housewives, etc., have revealed their secret remedies and methods: A peasant in the Hopei province, for instance, made public a family secret for three generations, a remedy for *leukorrhea*; another secret prescription, obtained in Kiangsi, composed of *ailanthus glandulosa* and wild pumpkin, has proved very effective in the treatment of dysentery. In order to preserve the experience and skill of the very old traditional practitioners for future generations, the health departments of various provinces have selected a number of clinically experienced western and traditional doctors to study under their guidance. Physicians of the traditional school have also been urged to train more apprentices (there are now throughout China about 70,000 of the latter). Another recent step in the same direction was the establishment of thirteen medical colleges and numerous schools where traditional medicine is taught to students. The translation of medical Chinese classics into modern language and the compiling of textbooks have also been undertaken, and the health departments have invited outstanding traditional physicians to write down their theories and experiences (T'ang Yang-Ch'un, an eminent 70-year-old traditional doctor in Chungking has already written, and presented to the Chinese Government, two volumes of *Instructions on the Treatment of Fevers* and three volumes on *Tested Remedies*). At the same time, there is a great amount of research going on in Peking and other medical centers endeavoring to test the efficacy of traditional meth-

ods and drugs in the light of modern science. It is stated in this report that it has been already found out that some of these, often believed to be fictitious and unscientific, have indeed a sound scientific basis, as, for instance, the belief in the "meridian system" in the human body on which traditional *acupuncture* is based. As a result of the increased participation of traditional doctors in the fight against disease, from 1956 to 1958, according to statistics, more than 134,000 schistosomiasis patients were cured almost entirely through traditional methods. Production and supply of traditional drugs have greatly increased, and their quality is continually being improved (wild medical herbs are now cultivated and animals of medical value raised on a large scale). It is emphasized in this report that the measures aimed at implementing the new trend toward traditional medicine are welcomed by the broad masses of the Chinese people, who often prefer traditional methods because they find them simple and effective and in accordance with their constitution and habits.

#### **Operational Research in the University.**

NICOLAS MALLESON, M.D. British Medical Journal, pp. 1031-1035 (April 18), 1959 (London).

The author defines *operational research* as "the study of what goes on, of what happens to the student, and reciprocally to his university environment, as the two go through their course together." In comparison with the large volume of work on *selection* problems, there has been very little systematic work on operational research in either Great Britain or the U.S. The American publications on this subject, it is pointed out, consist of numerous small unconnected studies, scattered through a great many psychological journals, and dealing mainly with motivation and attitude development. The only substantial work known to the author seems to be the research on sociological studies in medical education carried out by the Sociology Department of Columbia University (cf. Merton, Reader, and Kendall, *The Stu-*

*dent-Physician*, Harvard University Press, 1957; see also the series of valuable studies collected by Wedge under the title: *Psychosocial Problems of College Men*, Yale University Press, 1958). In England, the work done in operational research is not extensive either but, according to Dr. Malleson, does constitute a good beginning. The most important recent study, to be published soon, is that of Furneaux, of the Nuffield Research Unit at the Institute of Psychiatry (large numbers of applicants to the University of Sheffield were tested, categorized by various methods, and their progress followed over 10 years). Recently, the University of Liverpool has also made an important contribution by collecting and publishing a detailed analysis of the academic achievements of students taken from the University records. Dr. Doris Thoday (1955 and 1957) has done a series of studies with students at Birmingham University, developing a standard interview technique (which obviates many of the shortcomings of retrospective questionnaires) and, as a result, has been able to publish several papers covering such matters as vacation work, varying hours of study in different years, etc. Dr. Parnell at Oxford (1954) has studied the relationship of physique to different aspects of student performance. Mentioned in this survey, as of great importance to both medical education and university practice in general, are also the recent studies of examination techniques, particularly those of Bull (1956) at Belfast, and Lennox, Anderson, and Moorhouse (1957) at Glasgow. As to the work done in operational research at University College, London (the author's University), selected for discussion are two examples showing the sort of work that can be done. The first, picked out of two retrospective questionnaire studies (covering 1948-51, and, more comprehensively, 1953) deals with student failures. Among the resulting data, one surprise-finding is emphasized in relation to the "grants system" (considered one of the troubles which ail British universities today): Contrary to expectation, it has been ascertained that students coming from

State-supported "grammar schools" (mainly with the help of grants and with home backgrounds to whom university education is a complete novelty) showed a failure rate of 11.7 per cent, whereas that of privately educated students was two and a half times as great. The second example, taken from an unpublished study on "2nd M.B. students" coming up for examination in March, 1957, illustrates how this sort of work will give more questions than answers. Unlike the usual studies on examinations, inevitably retrospective, this one got the students to complete the questionnaires after they had done their papers and some of their practicals but before final results were known. The questionnaire covered all the areas of motivation and asked about examination nerves, sociability, and personal history in the university. The results (detailed figures are shown in various tables), says Dr. Malleson, "were nothing—or almost nothing." Besides the data on difference in schooling and the usual comments on pre-examination strain, the only item of interest was the finding (in accord with clinical experience) that strain affected particularly the upper and the lower strata of a class while the "middle quartiles" were relatively free from worry. The most remarkable part of the study, however, was found in the answers to questions about private study: no consistent differences were discovered between good and bad students in the amount of private study reported. More surprising still, the author found, was the enormous range of difference between individuals. How is it, he asks, that one young man, selected on much the same criteria as another, does 5 times as much study and yet gets considerably lower grades? A possible answer lies in differences of *study technique*, which, in turn, raises a new series of questions, worth studying closely, in his opinion, such as: How many hours of reading represent the optimum? What is the most efficient way of reading? Are detailed notes essential or time-wasters? If there are variations between students, what determines them? Is the ectomorphic introvert different in his optional study re-

quirements from the mesomorphic extrovert? etc.

**Avoiding Failure by University Students.** NICOLAS MALLESON, M.D. *The Listener*, March 5, 1959.

Next fall about 27,000 young people are expected to enter British universities. How many of them will fail? The best estimate says about 15 per cent (half of these will drop out at the end of the first year; a quarter at the end of the second, the rest during their third or fourth years). A 15 per cent failure rate, in the author's view, is too high. It means "wasting" 6,000 students yearly, which, in terms of money, amounts to something in the region of 3,000,000 pounds a year. It also means the waste of university places. Britain is already hard-pressed to educate enough people. In a few years, the "bulge" of post-war babies will reach the university age. To absorb them will not only need more funds but also more space and trained staff. Dr. Malleson believes that the most rapid and economical way to add some 10 per cent to the available facilities would be to cut into the failure rate. Such cuts would be especially effective in the science and technology departments where failure rates (up to 30 per cent) are higher than in the humanities, while more staff and facilities are needed there than anywhere else. The worst of the matter, however, is, as the author points out, "that so many young people, bright above the average, are being turned out to start their life with a failure." It is his contention that many failures (often due to an unreliable system of examination grading) are as much the fault of the university as of the student. Sometimes the glib answer to the question of why so many students fail, is that they were just not good enough, implying that there should be a better selection. However, the author does not think that a stricter selection would help much. It would only mean to throw out better students than one used to. Given a reasonable selection system, it is *what happens to students both in their academic and their personal life*, and

*what the university itself does*, that matters. "Operational research" might bring to light the most important factors in student failure (on the actual state of "operational research," see abstract of Dr. Malleson's detailed survey, above). There is a great need for more research, not only into methods of teaching but also into methods of study; into the influence of pre-university schooling, social-class background, athletics and student Union activities, on the failure rate (studies done at the University College, London, suggest that the academically successful student is an "all-rounder"), and, above all, questions of personal distress and anxiety must be investigated more thoroughly. The cause of the mental strain from which many students seem to suffer is often "examinitis," but there are a series of other matters, such as girl or boy friend problems, difficulties with the family, social adjustments, etc., which, although the common lot of all young people growing up, add to the total of student anxiety. Anxiety is so relevant to academic failure, because the first thing that happens to a student in distress is that his work deteriorates. Therefore it is very important for the university to make available people—and not only medical people—who are able to help the student in trouble. British universities, it is pointed

out, have been open to criticism in this aspect. However, although the ultimate purpose of university education has been for many years—and continues to be—the subject of lively controversy, everybody does agree today that the university's educational responsibility goes far beyond the mere teaching of degree subjects. Left to himself, the average student is unlikely to make the best use of all the university has to offer. In British universities there is nowadays, among the teaching staff, a growing awareness that it must do more than deliver lectures: that it must attempt to help the individual student over his difficulties with studying and must guide him toward "the proper apportioning of his intellectual resources" (through the *tutorial* system an increasing number of British universities does now assume responsibility for students not only in matters of study but in more general aspects of university life, such as grants, courses, accommodations, etc.). Over the last 10 years, Student Health Services have also been established in many British universities. In his conclusions, the author points out that "there is not a major industry in the country . . . that is as ignorant of its own 'production processes'" as are the universities. However, efforts are now beginning "to try to find out" and to create the human agencies needed to fill the worst gaps.

## NEW BOOKS

KENNETH E. PENROD, M.D.  
Book Review Editor

### Abstracts

**Surgery of the Foot.** By HENRI L. DUVRIES. St. Louis: The C. V. Mosby Co., 1959. 469 pp., 403 figures. \$12.50.

This book has been written in response to a continuing request by the authors, students, and colleagues that he draw together in one place of reference the fundamentals and recommendations contained in his lectures and clinical demonstrations over a span of 30 years. Extreme disabilities of the foot have received studious attention in many published reports. They have on that account been given only a cursory nod of recognition. This book is directed toward the commoner disabilities, which have been sparsely considered in medical writing and widely neglected in teaching and practice.

**Evolution of Nervous Control from Primitive Organisms to Man.** Edited by ALLAN D. BASS, with 11 contributors. Publication No. 52 of the American Association for the Advancement of Science, Washington, D.C., 1959. 226 pp. \$5.75.

This book is an outgrowth of a symposium organized by the Section on Medical Sciences of the American Association for the Advancement of Science and presented at the New York meeting December 29-30, 1956. The symposium, and this book, portray the impact of the evolutionary process upon the brain. The nine papers represent a variety of disciplines and viewpoints which are presented by a botanist, an embryologist, a neurologist, a neurophysiologist, a physiologist, a psychologist, and a psychiatrist.

**An Atlas of Normal Radiographic Anatomy.** By ISADORE MESCHAN, with the assistance of R. M. F. Farrer-Meschan. 2d ed. Philadelphia: W. B. Saunders Co., 1959. 741 pp., 1446 illustrations. \$16.00.

Anatomists are gaining an increasing awareness of the value of the x-ray beam as a dissect-

ing tool, and as a valuable technique for supplementing conventional dissection exercises, with demonstrations of *in vivo* anatomic study. Practically every discipline in clinical medicine is also making increasing use of this diagnostic medium. Progress has been so rapid in the past 8 years as to necessitate this new edition. Once again it is the purpose of this book to present not an encyclopedic reference, but rather a practical, useful text for medical students, general practitioners, residents, especially in radiology, and x-ray technicians. There are many areas of major revisions including a chapter on radiation protection; a chapter dealing with bone growth and development completely rewritten in the light of more dynamic concepts in this area; the radiographic reproductions and their tracings have been replaced by new illustrations, in many instances using electronic prints. The chapter on radiographic study of the brain has been considerably modified. Additions have been made to the chapter on the spine. A special study of the heart and major blood vessels probably represents the area of greatest development in radiographic anatomy. Many advances have been made in this portion of the book. Many newer aspects of gastrointestinal radiographic anatomy have been included, such as the new concepts of the swallowing function, measurements of the stomach and its relationship to the spine and retrogastric structures, and the improved double contrast colloidal barium and air colon study. New illustrations have been introduced wherever possible to demonstrate confusing appearances and variations from normal.

**Parsons' Diseases of the Eye.** By SIR STEWART DUKE-ELDER. 13th ed. New York: The Macmillan Co., 1959. 586 pp. with 459 figures. \$8.75.

This is the 13th edition of a textbook started 52 years ago. Since the 12th edition Sir John Parsons has died, but the present author has made an attempt to continue uninterrupted the

pattern established by Dr. Parsons. Despite a considerable revision of the 12th edition, this edition too has undergone considerable revision. The therapeutic value of new drugs, the importance of virus infections, the advances of understanding of the etiology and pathology of the many ocular diseases are only a few of the main themes that require considerable revision. Also, there has been some rearrangement of the sequence of the subjects discussed. The general philosophy of the book, however, has been retained in the hope that it will remain a concise and reliable guide to the diseases of the eye for students, general practitioners, and junior ophthalmic surgeons.

**The Historical Development of Physiological Thought.** Edited by CHANDLER MCC. BROOKS and PAUL F. CRANEFIELD, with 17 contributors. New York: The Hafner Publishing Co., 1959. 380 pp. \$6.00.

The lectures which have been compiled in this book were given as a series of symposia held November 13-15, 1956; January 8-10, 1957; and April 9-11, 1957, to commemorate the 100th year of the founding of the State University of New York Down-State Medical School. The focus of these symposia was on examples of physiological concepts which have contributed to understanding of the operation of biological systems and behavior of living organisms. This monograph should appeal to those who are concerned with the origin of ideas, the processes by which knowledge is obtained, and the fundamental structure of our precepts.

**Textbook of Pediatrics.** Edited by WALDO E. NELSON, with 81 contributors. 7th ed. Philadelphia: W. B. Saunders Co., 1959. 1413 pp. \$16.50.

This edition, without shifting from the pattern of a text to that of a compendium, is somewhat shorter than its immediate predecessor. Again, the authors have done their best to serve the student and the practitioner in their search for a better understanding of the medical problems of infants and children. It is not possible to enumerate the extent of change in the various divisions. In certain ones there are completely new chapters by new contributors or new hands working with the authors of the preceding edition. In addition, there are several new sections, including Tropical Eosinophilia, Kala-azar, Cirrhosis of the Liver in Indian Children, Pul-

monary Ventilation in Health and Disease, Mesenchymal Diseases, Behavior Problems Associated with Organic Brain Damage, and The Physician and the Child with a Handicap. Throughout the book there has been a "word by word" revision or re-appraisal. No attempt has been made to provide a comprehensive bibliography. An attempt has been made to include references to articles containing extensive bibliographies for as many subjects as possible.

**Survey of Clinical Pediatrics.** By LAWRENCE B. SLOBODY. 3d ed. New York: McGraw-Hill Book Co., Inc., 1959. 530 pp. \$11.00.

This survey of clinical pediatrics is not intended to replace the excellent large textbooks that are now available. It is rather designed to help the student and practitioner focus on the highlights and relationship of pediatrics. Almost the entire book has been revised and brought up to date. New developments in pharmacology, such as the discovery of new antibiotics and steroids and the use of psychotherapeutic agents have been incorporated. New material has been added on nutritional requirements, immunization schedules, abnormal hemoglobins, and psychosocial development. A complete change in the approach to congenital heart disease has been incorporated in that chapter. New clinical entities have been added, e.g., ECHO and adenovirus diseases. The review questions at the end of each chapter have been completely revised, with more use of the objective type of question. Throughout a good integration with the basic sciences has been presented. Finally, the consideration of the child as a whole—that the physical, mental, emotional, and social aspects are indivisible—receives continual emphasis.

**Preventive Medicine—Principles of Prevention in the Occurrence and Progression of Disease.** Edited by HERMAN E. HILLEBROE and GRANVILLE W. LARIMORE, with 29 contributors. Philadelphia: W. B. Saunders Co., 1959. 702 pp. \$12.00.

This book sets forth a new way to look at preventive medicine for medical students, general practitioners, specialists, and professional workers in official and voluntary health agencies. The main theme can be simply stated: the book distinguishes between the prevention of occurrence of disease and disability and the prevention of their progression. In every field, pri-

mary prevention, the prevention of occurrence, is the first goal. Secondary prevention, prevention of progression, is more difficult, more costly and less likely to be successful, because damage to the human body is already present. Over a period of several decades, medical and scientific staff members of the New York State Health Department have practiced and taught preventive medicine in nearby medical schools, in post-graduate courses for physicians throughout the state, and among the employees of their own hospitals, laboratories, and field clinics. The material in this book comes from lectures, seminars, and articles by these experts in preventive medicine and public health.

#### **Clinical Dermatology for Students and Practitioners.**

By HARRY M. ROBINSON, JR., and RAYMOND C. ROBINSON. Baltimore: The Williams and Wilkins Co., 1959. 228 pp. \$8.50.

The present members of the staff of the division of dermatology at the University of Maryland School of Medicine have collaborated in the writing of this text in order to carry on the tradition of morphologic dermatology taught by Dr. Harry M. Robinson, Sr. Essentially, the philosophy of this book is founded on the fact that the dermatologists must not be solely dependent on a casual visual examination but must study the entire patient in order to derive a definite diagnosis. He must correlate laboratory findings and clinical symptoms with clinical impressions afforded by morphologic skin changes. The skin is not only a protective covering but is a functioning organ which has nervous, vascular, and hormonal communications with the viscera, central nervous system, and the vascular system. It is the largest organ in the human body and frequently reflects disturbances in normal physiologic function, or pathologic changes elsewhere in the body. The major portion of the book is devoted to a discussion of the morphologic appearances of the more common dermatosis, methods of diagnosis, the relationship of cutaneous lesions to systemic disease and suggestions for treatment. Brief mention is made of the more uncommon dermatosis.

#### **Synopsis of Treatment of Anorectal Diseases.**

By STUART T. ROSS. St. Louis: The C. V. Mosby Co., 1959. 235 pp. \$6.50.

During the past several years it has become apparent that there is a great and growing inter-

est on the part of the general practitioner and medical student in the anorectal aspects of proctology. Although the surgical treatment of colonic diseases and the more complicated treatment of anorectal diseases may well be left to the specialist, most of the patients with anorectal difficulties are treated by the general practitioner. This book has been especially designed to help the man in general practice and also to serve as a guide to the medical student, intern, and the resident. With this aim in view, bibliography, statistics, and extensive discussion of etiology, pathology, and major surgical techniques have been omitted. On the other hand, essentials of diagnosis and treatment of all anorectal diseases have been included in a format which will permit easy and rapid access to information concerning the case at hand. A concise description of the anorectal structures is included, as well as a brief description of the common symptoms and methods of taking a proctologic history and performing a proctologic examination.

#### **Schizophrenia—An Integrated Approach.**

Edited by ALFRED AUERBACK with 15 contributors. New York: The Ronald Press Company, 1959. 216 pp. \$5.50.

In the past few years, stimulated in some degree by the advent of psychopharmacology, biochemical, neurophysiological, and brain metabolic studies, promising leads to the solution of this ancient and mysterious disease have been produced. Concurrently, psychiatrists have joined forces with sociologists, anthropologists, and ethnologists in the fields of communication and inter-family relationships. Unfortunately, most of this work in the field of schizophrenia is relatively unknown to the practicing psychiatrists. The reader of this book will note there are now many paths to travel in seeking the answers to schizophrenia, that no group or discipline alone will provide the solution. Only an integrated multi-disciplinary approach will lead us to effective methods of treatment. This book reviews the progress that has been made in the last few years, and the next 10 or 20 years will surely produce even greater enlightenment.

#### **A Manual of Bandaging, Strapping, and Splinting.**

By AUGUSTUS THORNDIKE. 3rd ed. Philadelphia: Lea and Febiger, 1959. 148 pp., 125 illustrations. \$2.75.

This manual presents in elementary fashion the common types of bandages, strapping, and splints to the inexperienced medical student, pupil, nurse, or orderly. The pen and ink drawings have been provided to facilitate graphic representation of these bandages, strappings, and splints to avoid the excessive use of words. In the second edition, the "Surgitube" type of bandage was included. This edition includes further developments of this type of bandage and its extension in sizes so that this can now be applied to head, to knee, to ankle, to foot, wrist, and hand. It is, of course, a useful adjunct to bandage materials but will result in higher cost. It is hardly conceivable that it can replace the gauze roll bandage. Further modification in the use of "quick-setting" plaster of Paris bandage has been included in this edition. New materials have been provided to better clarify and to simplify the interpretation of the text. To the intern, the resident, the nurse, and the physical therapist are presented the suggested techniques described in this small monograph.

**Anatomy and Physiology.** Edited by EDWIN B. STEEN and ASHLEY MONTAGU. College Outline Series, Vol. 1. New York: Barnes and Noble, Inc., 1959. 301 pp. \$2.50.

This book is designed to meet the needs of students and others who wish to learn or review the essentials of human anatomy and physiology. It provides a comprehensive summary for students of the biological sciences, nursing, occupational therapy, and physical education. It should be most helpful to medical and dental students at all stages of their education—undergraduate, graduate, and post-graduate. This volume is not intended as a substitute for laboratory research but rather as a supplement to it, and, finally, as a refresher of the memory long after introductory studies of the subject have been concluded.

**Give Us the Tools.** By HENRY VISCARDI, JR. New York: Eriksson-Taplinger Company, Inc., 1959. 266 pp. \$3.95.

The author was born with only two short stumps where legs should have been. The first 7 years of his life were spent in hospitals while doctors performed operation after operation. At the end of 7 years, he went home with his stumps encased in heavy padded boots that looked like boxing gloves. These he wore through school, including Fordham University and St. John's Law School at night. When 26 years of age Dr. Robert R. Yanover succeeded in making him a practical pair of artificial legs. Beginning with World War II Mr. Viscardi has had extensive experience in relaying to others his own experiences and fostering faith and hope in other handicapped persons. Today the author is President of Abilities, Inc., an organization concerned with providing opportunities for disabled men and women throughout the world. This book is written to instill hope in the minds of other handicapped.

**Gynecologic Endocrinology.** By GARDNER M. RILEY. New York: Paul V. Hoeber, Inc. 1959. 313 pp. \$8.50.

The materials of this book, constituting the fundamentals of reproductive physiology, are in a major sense an expansion of material first printed in 1950 in the form of a handbook entitled "Essentials of Gynecologic Endocrinology." Much has happened in this field in the intervening years requiring a considerable revision. In the main, the material of this book is directed to observations on the human rather than on experimental animals. This in some cases restricts source material and brings about inconclusive presentations in some phases of endocrine physiology but is considered fully justified. Considerable emphasis has been placed on the problems of infertility. It is emphasized throughout the book that the primary concern is the endocrine implications in the conditions discussed, but it is urged that good practice of medicine involves first an investigation of the possibility of organic, systemic, constitutional, or psychic causes before delving into the frequently controversial and obscure aspects of endocrine etiology.



## Profile

No art, no profession, no calling, can send forth such an extraordinary prodigy as the young doctor. He is an amalgamated mass of chemical symbols and decompositions, of atomic weights and theories, of microscopic specimens, botanic preparations, dissections, operations, diseases and dog Latin, of certificates, credentials, testimonials, and diplomas. He is, in fact, *crammed* to the mouth like a carpetbag, and *ground*

to the finest point like a lancet. He looks the very impersonation of science, and boasts of dissections, lectures, dresserships and bloody operations, in which he took the distinguished part of wringing out the sponge and looking on. He exhibits the diplomas of the College and the Hall to curious friends and maiden aunts.

—GEORGE ALLARTON (*Mysteries of Medical Life*) London: Bailliere, 1856, pp. 80-81.



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## NEWS FROM THE MEDICAL SCHOOLS

### Alabama

Members of the Medical Center psychiatry department will have new headquarters upon completion of a clinic building now under construction. Plans for the new building, which will greatly expand facilities for out-patient psychiatric care, include a group therapy room, a child treatment demonstration area, 27 consultation rooms and a spacious waiting area as well as the needed offices and storage space. Fully staffed, the clinic will be capable of handling 65,000 patient visits a year, according to Dr. JAMES N. SUSSEX, chairman of the psychiatry department. The two-story building is constructed so that two more floors may be added when needed.

### Albany

Five medical educators from foreign lands have been added to the faculty of Albany Medical College as assistant instructors. They are: MAHMOUD SEBGHATI, Tehran, Iran, and HIROKUNI SAKAI, Yokohama, Japan—anesthesiology; RAJINDAR F. JONEJA, Delhi, India, and NICHOLAS N. VELARDE, San Isitro, the Philippines—neurology; and PERIHAN ARAL, Ankara, Turkey—psychiatry.

### U. of Chicago

University officials were informed recently that the Public Health Service has formally approved a \$1,068,034 grant for a new clinical research building. Total cost of the project is estimated at \$3 million. The six-story structure is scheduled for completion by 1961 and will bring to 14 the number of research buildings at the university's medical center. The building is to be named

in honor of the late Philip D. Armour, industrialist and meat-packing heir who died in January 1958. Contributions will also come from his estate, the Armour family, and the university.

### Colorado

Dr. ROBERT J. GLASER, dean and professor of medicine, was recently named vice-president for medical affairs at the university. He will continue to serve as dean of the school of medicine. Dr. Glaser came to Denver in 1957 from the Washington University School of Medicine where he was associate dean and associate professor of medicine.

Dr. DAVID TALMAGE has been named professor and head of the division of allergy in the department of medicine. Dr. Talmage comes to Denver from the University of Chicago Medical School where he held a similar position.

### Georgetown

The Department of Health, Education, and Welfare has approved a matching grant of \$350,000 toward the construction of health research facilities on the Georgetown campus. Groundbreaking is scheduled for the spring of 1960. The new building, estimated to cost \$3.5 million, will provide the basic science research facilities to supplement applied research in the diagnostic and research building recently completed in the Medical Center.

### Harvard

Dr. CHARLES C. LUND, clinical professor of surgery at the Harvard Medical School, has been named acting head of the Fifth Surgical Service and the Sears Surgical

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Laboratory at the Boston City Hospital as well as acting head of the department of surgery at the Boston City Hospital where he has served as Surgeon-in-Chief of the Fifth Surgical Service since 1951. He will assume the responsibilities of Dr. J. ENGLEBERT DUNPHY, who resigned to become professor and head of the department of surgery at the University of Oregon Medical School.

A new approach to the study of man's first beginnings, his embryonic growth, post-natal development, and the medical aspects of femaleness as opposed to maleness, has been initiated at the Harvard Medical School, thus bringing together the research and teaching activities of the department of obstetrics and gynecology. As a result, a single department of obstetrics and gynecology has been formed. The decision to combine the two departments followed two years of study by a committee of the faculty of

medicine at Harvard. Their findings included the proposed reorganization of the departmental structure and of the teaching programs concerned with lectures, seminars and laboratory sessions. The goal of the department will be to produce full-time teachers and investigators to meet the rapidly expanding need of this field of medicine, according to Dr. GEORGE P. BERRY, dean. Students specializing in obstetrics and gynecology will be expected to devote a minimum of two years to general surgical training, three years in obstetrics and gynecology, and two years in the basic medical sciences.

### **Miami**

Dr. EDWARD W. D. NORTON has been named professor and chairman of the newly

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formed department of ophthalmology. The department was formerly a division of the department of surgery.

### Michigan

The University of Michigan's School of Public Health has been approved by the Atomic Energy Commission to teach radiation control and health physics to students holding A.E.C. scholarships. Two years of study will be required for a student to win a master of public health degree in this specialty. Only students employed in state regulatory agencies may enroll in the radiation control program, although a comparable program in health physics is open to any student with proper academic qualifications.

### Missouri

Dr. IAN M. THOMPSON, former assistant professor of surgery at the University of Michigan Medical Center, has been appointed chairman of the department of urology.

### New York University

The manager of the Atomic Energy Commission's New York operations office since 1954, has resigned to accept a faculty post at NYU-Bellevue Medical Center. Dr. MERRIL EISENBUD has been appointed professor of industrial medicine and will assume direction of a newly established laboratory concerned with the study of long-range effects of radioactivity on man. Made possible by a ten-year grant from the Rockefeller Foundation, the laboratory will be a unit of the Institute of Industrial Medicine of which Dr. NORTON NELSON is director.

Construction has now begun on a model home, the "Functional Home for Easier Living" on the grounds of the Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center. The one level house, designed for the physically disabled, the cardiac and the elderly, will be used as a model for visitors and for the training of disabled homemakers who are patients at the Institute. All the recom-

mendations made for the model home have been incorporated into a brochure which offers practical suggestions on many of the major difficulties that face physically handicapped persons in their homes.

### North Carolina

A new project calling for Panamanian hospital personnel to come to the North Carolina Memorial hospital to study modern hospital administration for a period of six months will get under way next year, according to university officials. The personnel who will be training at N. C. hospital will become staff members of a new hospital now under construction in Panama City, C.A. All expenses in connection with the program will be met by the Government of Panama, including tuition payments to the UNC hospital.

### Northwestern

The medical school celebrated its 100th anniversary with day-long festivities September 29. Ceremonies included the Founders Day Convocation, a Colloquium of Medical Sciences, and a Centennial Awards dinner. The Founders Day Convocation is held in late September every year to mark the beginning of the academic year and to commemorate the seven men who, in 1859, broke away from the faculty of Rush Medical College to form what was to become the medical school of Northwestern University. Dr. CONRAD ELVEHJEM, president of the University of Wisconsin, and one of eight scientists receiving honorary doctor of science degrees at the convocation, delivered the Founders Day address.

Dr. LESLIE B. AREY, professor of anatomy emeritus, has just completed an historical book, "Northwestern University Medical School, 1859-1959—A Pioneer in Educational Reform." Publication date coincided with the Centennial celebration.

### Pennsylvania

The 18-man surgical staff of the Medical Center contributed a total of \$200,000 to-

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### Pittsburgh

**EDWARD B. JONES**, assistant administrator at Passavant Hospital, has joined the University of Pittsburgh Health Center staff as executive assistant to Dr. E. R. McCLUSKEY, vice chancellor for the Pitt Schools of the Health Professions. As successor to JOHN C. DUMAS, who has accepted the position of superintendent of Minneapolis General Hospital, he will be working with administrators of hospitals closely associated with the university.

### Rochester

A model arthritis evaluation and demonstration center will be established with a grant of \$78,390 awarded to the school of medicine and dentistry by the March of Dimes. Under the direction of Dr. RALPH F. JACOX, associate professor of medicine, the center will be located in the University of Rochester Medical Center with its two affiliated teaching hospitals, the Strong Memorial hospital and Rochester Municipal hospital. It will have complete resources for diagnostic, orthopedic, pediatric, psychiatric, and social service care of patients with arthritis. According to university sources, the grant will not only increase the existing facilities for the evaluation, treatment and rehabilitation of arthritis patients available at the UR Medical Center, but will also support clinical investigation to develop and improve arthritis medical care and a program of teaching modern techniques of arthritis treatment to doctors and other medical personnel.

### Seton Hall

**Dr. JOSEPH M. FOLEY** has been appointed professor and director of the division of neurology in the department of medicine. Dr. Foley comes to Seton Hall from the

Harvard Medical School where he has been on the faculty as assistant professor of neurology since 1951. He has served on the staff of Massachusetts Memorial Hospital and, in addition to being a consultant to the Veterans Administration, is a National consultant to the U.S. Air Force.

### S.U.N.Y. Brooklyn

Three visiting professors from Australia and England will join the S.U.N.Y. Downstate Medical Center in Brooklyn this fall. Appointed visiting professor of physiology for one year was Dr. DAVID R. CURTIS, a fellow of the John Curtin School of Medical Research of the Australian National University since 1954; Sir GEORGE W. PICKERING, Regius professor of medicine at Oxford University since 1957, was named visiting professor of medicine from Sept. 7, through Oct. 5; and Dr. JOHN C. MOIR, Nuffield professor of obstetrics and gynecology at Radcliff Infirmary, Oxford, England, was named visiting professor of obstetrics and gynecology for one month, beginning October 1.

Two professors have retired from the Downstate Medical Center to become emeritus professors. They are Dr. ARTHUR W. GRACE, professor and head of the department of dermatology and syphilology for more than 20 years, and Dr. E. JEFFERSON BROWDER, professor and chairman of the department of neurosurgery. Dr. Browder has served on the faculty for the past 34 years. Neither professor is retiring from active professional life as both expect to continue their practice in Brooklyn. In addition to his practice, Dr. Grace will direct a research project at the Downstate Medical Center under a grant from the Public Health Service. Dr. Browder, who is attending surgeon at the Long Island College hospital, plans to carry on special research in the surgical treatment of patients with brain tumors and to publish his results.

### Texas Medical Branch (Galveston)

Dr. WILLIAM JAMES McGANITY, former associate professor at Vanderbilt University School of Medicine, has been appointed vis-

# *Individual Membership*

in the

## Association of American Medical Colleges

In recent years the activities of the Association of American Medical Colleges have expanded far beyond the original considerations of administrative problems to the many and varied problems of medical education as encountered by the entire medical school faculty.

The expansion of activities has been due to the growing complexity of medical education—the swift development of the medical sciences, the rapid accumulation of new knowledge to be taught, the pressure for more graduates, the changing patterns of medical care, and countless other factors.

Because of these factors, the AAMC recognizes the need for a professional organization to represent not only the medical schools but the faculty members of these schools. Through the offering of individual membership, the AAMC provides you with the opportunity to exchange ideas, opinions and information through the Annual Meeting, Teaching Institutes, and other activities of the Association.

The AAMC also encourages you to attend the Annual Meeting, not only to meet with others who are teaching in your field and discussing the educational problems that are peculiar to it, but also with the idea of becoming familiar with the entire field of medical education as one of society's most important enterprises. The time has come when teachers of medicine must meet together and discuss the problems and activities that are peculiar to medicine as education just as they are accustomed to meet and talk about medicine as science.

As an Individual Member you are entitled to receive *The Journal of Medical Education*, the only publication devoted exclusively to medical education. The Journal also carries the latest news from the medical schools and provides a valuable service through its Personnel Exchange column. You receive the yearly *Directory*, the Proceedings of the Annual Meetings, and *The Medical Mentor*, a newsletter which will keep you informed on items of current interest in the field of medical education, both nationally and internationally.

Individual Membership, at only \$10 a year, is open to any person who has demonstrated a serious interest in medical education over a period of years. All the privileges of membership and a provisional membership card are granted immediately after payment of the \$10 fee, although confirmation must await official action at the next Annual Meeting.

To obtain membership, fill out the application form below, append check for \$10, and return to the Association's central office at 2530 Ridge Ave., Evanston, Ill.

### INDIVIDUAL MEMBERSHIP APPLICATION ASSOCIATION OF AMERICAN MEDICAL COLLEGES

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Name: \_\_\_\_\_

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(City)

(Zone)

(State)

Field of medical education in which chief interest lies: \_\_\_\_\_

College or other connection: \_\_\_\_\_

iting professor of obstetrics and gynecology, effective September 1, and on January 1, 1960, will take over the duties of chairman of that department. He succeeds DR. GARTH JARVIS, who will continue as a professor in the department.

#### **U. of Washington**

DR. JAMES W. HAVILAND, assistant dean of the school of medicine, resigned his administrative position Sept. 1, in order to enter the full-time practice of medicine in Seattle. Dr. Haviland has been assistant dean on a half-time basis since 1954, after serving a year as acting dean. Dr. Haviland will retain his appointment as clinical professor of medicine in order to maintain his contacts with the teaching program.

#### **Wayne State**

DR. RICHARD J. BING, Bavarian born physician, has been named William H. McGregor professor of internal medicine and chairman of the department of medicine. A former professor of medicine at Washington University (St. Louis) and director of the Washington University Medical Service, Dr. Bing attended the Universities of Vienna and Berlin and received his M.D. from the University of Munich in 1934 and another M.D. degree from the University of Bern in 1936. He came to this country in 1938 when he was awarded a fellowship in

the Rockefeller Institute. Dr. Bing has also served on the medical faculties of Columbia, Johns Hopkins, and Alabama.

#### **Wisconsin**

DR. KENNETH LEMMER, professor of surgery, was recently honored by being elected to membership in the International Society of Surgery, a worldwide group with headquarters in Brussels, Belgium. Election to the Society is on the basis of research accomplishment. Dr. Lemmer attended the 19th Annual Congress of the Society in Munich, Germany, Sept. 13-20, as a member of the American delegation.

The new Respiratory and Rehabilitation Center at the University of Wisconsin Medical School opened in September. The unit, which is being developed in the department of pediatrics, is housed on the seventh floor of the University Hospitals where office space and pulmonary research laboratories, as well as occupational and physical therapy functions will be available. According to university officials, the Center is the first of its kind in Wisconsin and will also accept patients from Iowa, Minnesota and parts of South Dakota. Under the direction of DR. ARTHUR A. SIEBENS and the department of pediatrics, the program is a collaborative enterprise with medicine, orthopedics and physical medicine.

## **ITEMS OF CURRENT INTEREST**

#### **Second World Conference on Medical Education**

An estimated 1,500 educators and physicians from 66 foreign countries, including Russia, attended the Second World Conference on Medical Education at the Palmer House, Chicago, Aug. 30-Sept. 4. Dr. Raymond B. Allen, chancellor of the University of California at Los Angeles, presided over the sessions. Dr. Allen noted that physicians everywhere must be constantly alert to guard their freedom against government interference. He commended the educators

from throughout the world for coming to Chicago to "exchange ideas about the art of educating and training the physician."

In summarizing achievements of the meeting at the closing session, DR. WARD DARLEY, AAMC Executive Director, said that it was good to learn that physicians the world over are concerned with the importance of preserving the doctor-patient relationship "as a bulwark against the systematization and impersonalization that seems to be creeping into so many aspects of medical care and education."

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Conference sponsors were the World Medical Association, World Health Organization, the Council for International Organization of Medical Sciences, and the International Association of Universities. To facilitate inter-communication among delegates from the 66 foreign countries, the conference sessions were simultaneously translated into English, French, and Spanish.

#### MEND News

The date of affiliation with the MEND program for 15 additional medical schools, announced in the August issue of this *Journal* as January 1, 1960, has been moved up to October 1, 1959. The new date will enable faculty members of these schools to participate in two important symposia scheduled for this fall. The symposia deal with the topics of "preventive medicine and health mobilization," to be conducted by the Public Health Service on October 12-16, and "blood, fluids, and trauma," to be held at the Walter Reed Army Institute of Research on December 15-17.

#### C. P. Rhoads Dies

Dr. C. P. Rhoads, director of the Sloan-Kettering Institute for cancer research in New York City, died after a heart attack at his home in Stonington, Conn. A leader in the search for the cause and cure of cancer, Dr. Rhoads also was scientific director of the Memorial Center for Cancer and Allied Diseases in New York.

#### Aerospace Medical Center to Open

The U.S. Air Force announced plans to establish an Aerospace Medical Center at Brooks AFB, San Antonio, Texas, around October 1, 1959. According to Major General O. K. Niess, Air Force surgeon general, the Aerospace Medical Center will consolidate and serve as headquarters for existing USAF medical service facilities in the San Antonio area, including the USAF School of Aviation Medicine, Brooks AFB, Texas; the USAF Hospital, Lackland AFB, Texas; the USAF Epidemiological Laboratory, Lack-

land AFB, Texas; and the School of Aviation Medicine Branch at Gunter AFB, Alabama.

#### National Tuberculosis Assn. Offering Fellowships

The National Tuberculosis Association, through its medical section, the American Trudeau Society, is offering fellowships in the field of respiratory diseases and tuberculosis to assist in the training of investigators and teachers of medicine. Candidates holding the degrees of M.D., Ph.D., or Sc.D., are eligible for awards making possible continuation of graduate study in the field of respiratory diseases in an approved hospital or medical center. Such studies may be oriented toward either teaching or research. \*Predoctoral fellowships are also being offered to graduate students who hold a bachelor's degree and are working on a research project for an advanced degree other than an M.D. Further particulars concerning fellowships may be obtained by writing to The Director of Medical Education, American Trudeau Society, 1790 Broadway, New York 19, N.Y.

#### Dow Corning Establishes Center to Help Medical Research

Dow Corning Corporation announced the founding of the Dow Corning Center for Aid to Medical Research. According to Dr. W. R. Collings, Dow president, purpose of the Center will be to aid medical research by supplying technical assistance, by acting as a clearing house for information about the use of silicones in medicine and surgery, and by cooperating in research in organosilicon chemistry in relation to the human body. Director of the new center, which will be located at Midland, Mich., will be Dr. Rob Roy McGregor.

#### Essay Competition Open to Medical Students

The American Association for the History of Medicine again invites students of medical schools of the United States and Canada

to compete for the William Osler Medal. This prize is awarded annually for the best unpublished essay on a medico-historical subject and commemorates the well-known physician, Sir William Osler. Essays submitted should not exceed 10,000 words in length and the winning essay may be considered for publication in the *Bulletin of the History of Medicine*, official organ of the society. Entries may be sent any time before April 1, 1960, to Dr. Samuel X. Radbill, Chairman of the William Osler Medal Committee, 7043 Elmwood Ave., Philadelphia 42, Pa.

#### Mead Johnson Grants for Pediatric Research

The Awards Committee for the Mead Johnson Program for Pediatric Research of the American Academy of Pediatrics announces the availability for the coming year of funds to provide financial aid to young pediatric research workers. The funds are provided by Mead Johnson & Company under rules established by the Academy's Awards Committee. The maximum amount for any one grant in any year is \$3500. Grant applicants should be pediatricians who are not more than 10 years beyond the completion of their residency. These grants are specifically intended to encourage the young, unestablished, research-minded, academic pediatrician. Deadline for receipt of grant applications for July 1960 will be January 15, 1960. Interested persons should write to the American Academy of Pediatrics, 1801 Hinman Ave., Evanston, Ill.

#### Fellowships in Psychiatry Available

The American Psychiatric Association will continue its program of fellowships in psychiatry for the current year. Made possible by a grant from the Smith, Kline and French Foundation of Philadelphia, the program is intended to interest physicians and medical students in psychiatry and mental hospitals and to advance levels of treatment and care in these institutions. Several types of awards are available and applications from individual physicians, medical students, or institutions will be considered so long as they relate to these purposes.

Of interest this year are the new "Seymour D. Vestermark Fellowships" for medical students. Named in honor of the late chief of the Training Branch of the National Institute of Mental Health, these fellowships are intended particularly to stimulate interest and knowledge in psychiatry among outstanding medical students. A brochure describing the program in detail and how to apply will be sent upon request by writing to Dr. George N. Raines, Chairman, APA Fellowship Committee, 1700 18th St., N.W., Washington, D.C.

#### National Society for Medical Research Publishes Report

Now ready for immediate delivery is the *Report on the National Conference on the Legal Environment of Medical Science* held in Chicago May 27-28, 1959. Selling for \$2.50 a copy, the Report may be obtained by writing to the National Society for Medical Research, 920 S. Michigan Ave., Chicago 5, Ill.

# PERSONNEL EXCHANGE

## Faculty Vacancies

**PSYCHIATRISTS:** Full-time and part-time teaching positions. Need coordinator of teaching grant program. Would function under departmental director. Address: Richard Egan, M.D., Creighton University School of Medicine, Omaha 2, Nebraska.

**ASSISTANT PROFESSOR OF PREVENTIVE MEDICINE:** Full-time appointment in department of preventive medicine with teaching and research opportunity, including comprehensive medical care teaching. Must have M.P.H. degree. Address: V-76.

**IMMUNOCHEMIST OR BIOCHEMIST:** Must be interested in field of infectious diseases. Activities include studies on immune mechanisms and on the biochemistry of virus infections. Full-time research position. Salary open; minimal \$8,000. Apply H. A. Wenner, M.D., Section for Virus Research, University of Kansas School of Medicine, Kansas City, Kansas.

**PSYCHIATRISTS:** Newly organized department of psychiatry in east coast medical school needs full-time psychiatrists for research and teaching. Rank and salary are dependent on experience and qualifications. Address: V-77.

**DIRECTOR OF MEDICAL EDUCATION:** for new 350-bed hospital. New position. Internal medicine specialist preferred for full-time position. Beginning salary about \$15,000 per year. Address inquiries to: Sister Administrator, Providence Hospital, Washington 17, D.C.

**PHARMACOLOGIST:** The University of Alberta invites applications for the position of Associate Professor of Pharmacology, effective not later than September 1, 1959, at a minimum salary of \$8,000 per annum, with annual increments. Duties include undergraduate and graduate teaching and a program of research. Applicants possessing a medical degree, in addition to qualifications in pharmacology, will be given preference. Applications should include a recent photograph or snapshot, a curriculum vitae, and the names of three references, and should be sent to the Dean of Medicine, University of Alberta, Edmonton, Alberta, Canada.

**PSYCHIATRIC SOCIAL WORKER:** Position open on new child psychiatry inpatient service to be opened on July 1. Research and teaching will be emphasized in developing program. Preferred qualifications are Ph.D. degree or doctoral candidate with solid clinical grounding in psychiatric social work. Master's degree in Social Work with 5 years psychiatric clinical experience will be considered. Position carries academic appointment. Send curriculum vitae with application. Address: V-78.

**PHARMACOLOGIST:** Full-time appointment in department of pharmacology for assistant professor of pharmacology. Ph.D. or M.D., preferably the latter, and previous training in pharmacology required. Salary \$7,000 or higher according to qualifications. Interested candidates should send a complete curriculum vitae and recent photograph to Dr. M. F. Murnaghan, Professor and Head, Department of Pharmacology, University of Ottawa, Ottawa 2, Ontario, Canada.

**ASSISTANT IN PSYCHIATRY:** Research assistant wanted for psychosomatic project from July 1, 1959. Associated university affiliation. Salary according to qualifications up to \$5,700. Apply to Professor R. B. Sloane, Department of Psychiatry, Queen's University, Kingston, Ontario, Canada.

**ENDOCRINOLOGIST-BIOCHEMIST:** M.D. to become director of biochemistry laboratory at a 400-bed general hospital with medical school faculty appointment. Duties to include teaching; research will be encouraged. Large Eastern city. Address: V-79.

**PHYSIOLOGIST:** Full time appointment in physiology department of large medical school. M.D. or Ph.D. with training and research interests in cardiovascular physiology. Rank and salary (Instructor to Associate Professor, starting \$6400 to \$9000 plus, respectively) based on qualification and experience. Insurance, pension, travel allowance, relocation, other benefits. To assume post September 1. Address: V-80.

**ANESTHESIA RESIDENCIES:** Announcing four appointments for residency in anesthesiology in approved department of anesthesia, University Hospitals of Cleveland, Ohio, beginning January 1, 1960, for graduates of approved medical schools or ECFMG-qualified applicants. Additional appointments for July, 1960. Stipend and other information may be obtained by writing Robert A. Hingson, M.D., Director of Anesthesia, University Hospitals of Cleveland and Professor of Anesthesia, Western Reserve University School of Medicine, 2065 Adelbert Road, Cleveland 6, Ohio.

**PHARMACOLOGIST:** Ph.D. Position available in a medical research institution devoted entirely to research work. Current problems deal with hematopoietic mechanism and arteriosclerosis. No immediate teaching, but possibility in the future if interested. Write to: Director, Toledo Hospital Institute of Medical Research, 2805 Oatis Avenue, Toledo 6, Ohio.

**BIOCHEMIST:** Ph.D. Trained in protein chemistry, for research institute work on isolation of regulators concerned with the mechanism of hematopoiesis. Address inquiries to: Director, Toledo Hospital Institute of Medical Research, 2805 Oatis Avenue, Toledo 6, Ohio.

**PSYCHIATRIST:** Board certified or Board eligible, to act as a consultant to state mental health clinics, plan education programs for clinic personnel, to assist communities in organizing mental health clinics, to teach medical students and psychiatric residents concerning the field of community mental health, and to organize and participate in research on problems in community mental health. Interest in child psychiatry desirable. Position carries a professorial appointment in the medical school. Rank and salary according to qualifications. Address: Paul E. Huston, M.D., Chairman, Department of Psychiatry, College of Medicine, State University of Iowa, Iowa City, Iowa.

**PEDIATRICIAN:** Full-time teaching and research. Interested candidates please send complete curriculum vitae and recent photograph to Dr. J. M. Severens, Creighton University School of Medicine, Omaha 2, Nebr.

To aid in solution of the problem of faculty vacancies, MEDICAL EDUCATION will list persons and positions available, as a free service. The school department or person may have the option of being identified in these columns or of being assigned a key number for each position listed. Mail addressed to key numbers will be forwarded to the person or department listing the request.

Information for these columns should reach the Personnel Exchange, Journal of Medical Education, 2530 Ridge Avenue, Evanston, Illinois, not later than the 10th of the month which precedes the month in which the listings will appear.

## Personnel Available

**THORACIC SURGEON:** M.D. 1947, University of Istanbul. Served an internship in surgery (1954-55) Montana Deaconess Hospital, Great Falls, Montana. Served as Fellow in Thoracic Surgery (sponsored by American College of Chest Physicians) Knoxville, Tenn. Presently in charge of thoracic surgery department at Armenian Hospital, Istanbul. Desires teaching position in American medical school. Address: A-391.

**PATHOLOGIST:** Age 35, married. Certified PA 1955. Academic background and three years teaching experience. Wishes to relocate in West. Will consider part-time or full-time teaching appointment. Especially interested in surgical pathology. Address: A-392.

**OTOLARYNGOLOGIST AND HEAD and NECK SURGEON:** Age 33; board eligible. University of the Philippines graduate. Completed six years' training in eastern medical centers (3 years otolaryngology, 6 months more bronchoesophagology, and 2½ years general and head and neck surgery). Desires one year fellowship, or assistantship, or academic position. Available January, 1960. Address: A-393.

**BIOCHEMIST:** Ph.D., age 30. Assistant professor of biochemistry desires academic position. Five years medical and graduate teaching experience. Membership in national societies, honors, grants, graduate students. Fifteen full-length publications. Research interests: enzymology, microbial metabolism and protein metabolism. Available July 1, 1959. Address: A-394.

**PHYSIOLOGIST-PHARMACOLOGIST:** Ph.D., 1954. Male, married, with family. Presently teaching physiology in dental school. Desires teaching position with research opportunities in physiology or pharmacology department. Address: A-395.

**PATHOLOGIST-BACTERIOLOGIST:** M.S., B.S. (London University); M.R.C.S. (England) L.R.C.P. (London). Age 42, family; registered with British General Medical Council. Five years experience in general and clinical pathology and bacteriology, London, England. Completing 3-year contract in Jamaica. Desires academic appointment in U.S., preferably in the South. Available May, 1959. Address: A-397.

**VIROLOGIST-PATHOLOGIST:** Excellent experience and background in infectious diseases, human and animal viruses. Broad interests include cancer and pathogenesis. D.V.M.-Ph.D., age 34. Presently in industry. Desires research and teaching position. Would consider Senior Fellowship. Address: A-398.

**INTERNALIST-HEMATOLOGIST:** Age 36, Board certified, with five years academic-type practice and previous research experience, seeks academic position in moderate sized city. Address: A-399.

**PSYCHIATRIST:** Female, age 26, completing final year of residency in June 1959. Training includes two years in an active university program and participation in family studies in schizophrenia. Analytically (Sullivanian) oriented. Special interests: Psychotherapy with schizophrenics, teaching professionals and non-professionals, liberal arts. Seeks position teaching in medical school with time for limited private practice. Interested in small university community. Address: A-400.

**PHARMACOLOGIST:** Ph.D., 1955; married, 3 children. Presently teaching pharmacology to medical students. Publications. Research interests: drug metabolism and toxicology. Desires teaching appointment in medical school that would provide opportunity for completion of courses leading to M.D. degree. Would continue teaching pharmacology after receiving the degree. Available August 1. Address: A-401.

**INTERNALIST:** M.D. Age 33. Currently on faculty of eastern medical school. Experience in private practice and industrial medicine. Eight months experience and training in psychiatry. Desires faculty appointment with opportunity for clinical investigation in cardio-vascular diseases, as well as teaching general medicine, in teaching hospital. Address: A-402.

**VETERINARIAN:** Experienced in microbiological techniques; presently at a medical school. Desires position as director of experimental animal laboratory. Address: A-404.

**MICROBIOLOGIST-VIROLOGIST:** Ph.D., presently on university faculty. Five years experience in virology and tissue culture publications. Desires academic position involving full-time research or research and teaching. Address: A-405.

**ORTHOPAEDIC SURGEON:** 38. Wants appointment in U.S.A. or Canada. Main interest in Traumatic Surgery and Research. Now holding consultant post at well known British Hospital. Mastership in Surgery and Fellow of the Royal College of Surgeons. Address: A-406.

**PSYCHIATRIST-NEUROPHYSIOLOGIST:** M.D. Certified in psychiatry and as a mental hospital administrator. FAPA and FSFA. No formal training in neurophysiology but using some of its principles with gratifying results in coping with the manifold problems of psychosomatic medicine. Desires full-time career teaching position in medical school with opportunities for teaching psychiatry; for learning clinical neurophysiology well enough to instruct; and for carrying on more intensive course of clinical investigation. Address: A-407.

**PHYSIOLOGIST:** Ph.D., 1957, age 31, married, one child. Research in cardiovascular-renal physiology. Strong background in hypertension. Eleven publications. Experience in teaching medical, dental, and pharmacy stu-

dents. Desires research position with or without teaching responsibilities. Address: A-408.

**MICROBIOLOGIST:** Ph.D., Sept., 1959. Training in all fields of basic microbiology with research in microbial metabolism. Desires faculty position with teaching and research opportunities in a university or medical school. Address: A-409.

**PHYSIOLOGIST-ENDOCRINOLOGIST:** Ph.D., age 36. Training and background in endocrine, cellular, mammalian and zoological physiology. Presently assistant professor engaged in teaching and research in endocrinology and general physiology. Formerly research associate in biochemistry. Desires academic and/or research position. Address: A-410.

**ANATOMIST:** Age 34, married. Ph.D. Anatomy 1957. Publications. Teaching experience in Eastern medical school. Desires teaching position with opportunity for research. Address: A-411.

**INTERNIST:** Age 35, married. Ten years training in internal medicine and hematology. Teaching experience and research in field of clinical hematology, B<sub>12</sub> metabolism, radioactive uptakes, experimental hematology, and enzyme studies. Desires teaching position with opportunity for research. Address: A-412.

**SURGEON:** Age 35, native of Bombay, India. In U.S. since 1952. F.C.P.S. (Bombay), F.R.C.S.E. (Edinburgh). Completed residency training in general surgery in U.S. and successfully taken Part I examination of American Board of Surgery. Desires full-time position in teaching and/or research in American medical school. Presently senior resident in surgery in Eastern hospital. Experience in plastic surgery as well as urology and anesthesiology. Address: A-413.

**UROLOGIST:** University trained, finished 1956. Seeking full-time academic post: teaching, research, and clinical work. Presently in private practice and part-time university teaching. Address: A-414.

**GROSS ANATOMIST:** D.S.D., Ph.D. Ten years teaching experience in medical school; previously taught in dental school. Clinical experience in plastic and oral surgery. Research interests and publications: homotransplantation of tissues. Desires academic position in medical or dental school with research facilities. Will consider research associateship with plastic surgery department. Address: A-415.

**MICROBIOLOGIST:** Ph.D. Seeking position on medical school faculty in Southeast or Southwest. Many years experience and supervision in clinical microbiology. Six years on medical school faculty. Qualified in parasitology, virology and public health. Address: A-416.

**SURGEON:** Age 33. Certified in surgery and thoracic surgery. University trained with research background. Presently holding part-time university teaching appointment. Desires full-time academic appointment in surgery, preferably with additional duties as assistant dean working with curriculum and postgraduate training program. Address: A-418.

**INTERNIST-GASTROENTEROLOGIST:** Age 42. Board certified in internal medicine and in gastroenterology. Training and experience include 4 years as Mayo Foundation Fellow, full-time instructor in gastroenterology in leading university, clinical investigation and private practice. Trained in all gastroenterological techniques and bone marrow interpretation. Qualified in hematology, peripheral vascular diseases and rheumatology. Desires academic position in internal medicine, gastroenterology, comprehensive medical care section, as Assistant Dean, or as Director of Medical Education in teaching hospital. Address: A-419.

**MICROBIOLOGIST-CLINICAL PATHOLOGIST:** M.D., Ph.D., age 54, married. Wide experience in teaching and research in the United States. Returning after several years of teaching in medical schools in the Far and Middle East. Textbook in course of publication. Desires research or teaching position in medical school or in teaching hospital. Address: A-420.

**PATHOLOGIST-VIROLOGIST:** DVM, Ph.D. Experience in comparative pathology, virology and tissue culture techniques. Also considerable experience in teaching experimental pathology to medical students. Desires teaching appointment in a medical school that would provide opportunity for completion of courses leading to M.D. degree. Address: A-421.

**PSYCHIATRIST:** Board certified, with training in both general clinical psychiatry and public health psychiatry (M.P.H. degree). Six years' experience in administering a community-oriented psychiatric training program in an academic setting. Broad range of personal service in teaching, supervisory, and consultative capacities. Dynamic orientation. Numerous research publications. Age under 40. Currently assistant professor at medical school. Desires full-time faculty appointment at higher level. Address: A-422.

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## PUBLICATIONS

Useful information for both medical educators and students is published by the Association of American Medical Colleges. These publications may be obtained from the Association headquarters office, 2530 Ridge Avenue, Evanston, Ill.

### Books and Pamphlets

Admission Requirements of American Medical Colleges—1958-59 (\$2.00).

History of the Association of American Medical Colleges—1876-1956

The National Health Service of Great Britain (\$1.00).

El Estudiante de Medicina (\$1.00)

Suggestions for Supplementing the Medical Curriculum in Time of National Emergency

A Study of Medical College Costs (\$1.50)

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Education of Physicians for Industry (\$2.00).

Support of Research by American Cancer Society (\$1.00).

Survey of Women Physicians graduating from Medical School 1925-40 (\$1.00).

Medical Education for Foreign Scholars in the Medical Sciences (\$1.50).

### Teaching Institute Reports (\$2.00 paperbound, \$3.00 clothbound).

Report of the Conference on Preventive Medicine in Medical Schools (Report of the 1952 Institute).

The Teaching of Physiology, Biochemistry and Pharmacology (Report of the 1953 Institute).

The Teaching of Pathology, Microbiology, Immunology and Genetics (Report of the 1954 Institute).

The Teaching of Anatomy and Anthropology in Medical Education (Report of the 1955 Teaching Institute).

The Appraisal of Applicants to Medical School (Report of the 1956 Institute).

The Ecology of the Medical Student (Report of the 1957 Institute).

### Medical Audio-Visual Institute Publications

Film Catalog, Fall 1955 and Supplements.

Films in Psychiatry, Psychology and Mental Health (available from the Health Education Council, 92 Belmont Drive, Livingston, N.J.).

Films in the Cardiovascular Diseases (Part I available from the American Heart Assn.), 44 E. 23rd St., New York 10, N.Y. (\$2.00).

Part II available from the Medical A-V Institute (\$2.00).

### Publications of Related Organizations

Hospitals Participating in the Matching Program 1959 (NIMP).

Results of the Matching Program 1959 (NIMP publication).

The Student and the Matching Program 1959 (NIMP publication).

Medical College Admission Test—Bulletin of Information 1959 (Educational Testing Service publication).

Psychiatry in Medical Education—1951 Conference (\$1.00).

The Psychiatrist: His Teaching and Development—1952 Conference (\$2.50).

(The above can be obtained from: American Psychiatric Assn., 1785 Massachusetts Avenue, NW, Washington, D.C.).



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lower stool frequency.*

**NEAREST...** to mother's milk in its pattern of protein, fat and carbohydrate by caloric distribution

**NEAREST...** to mother's milk in its pattern of vitamins and minerals (more vitamin D in accordance with NRC recommendations)

**NEAREST...** to mother's milk in its fat composition (no butterfat; no sour regurgitation)

**NEAREST...** to mother's milk in its ratio of saturated to unsaturated fatty acids

**NEAREST...** to mother's milk in its low renal solute load

ENFAMIL LIQUID—cans of 13 fluid ounces. 1 part Enfamil Liquid to 1 part water for 20 cal. per fl. oz.

ENFAMIL POWDER—cans of 1 lb. with measure. 1 level measure of Enfamil Powder to 2 ounces of water for 20 cal. per fl. oz.

MEAD JOHNSON & COMPANY, EVANSVILLE 21, INDIANA \*Trade Mark

*1. Macy, I. G.; Kelly, H. J.,  
and Sloan, R. E.; with the  
Consultation of the  
Committee on Maternal and  
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and Nutrition Board,  
National Research Council;  
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